

## **Transcript: Talking Tech - Episode 5 – Adam Wyner**

**DAVID FOWLIS: Hello and welcome to talking tech, a podcast from the legal services board that looks at the regulatory implications of new technologies for the legal services sector. I'm David Fowles, a regulatory policy manager at the Legal Services board. Today I'm joined by Doctor Adam Wyner of Swansea University's Centre for Innovation and Entrepreneurship in Law, and we'll be talking about what the increased use of technology to deliver legal services means for education and the approaches legal regulators could take to ensure that legal education provides lawyers with the skills and knowledge to use technology effectively and ethically. Adam, Welcome to the podcast if you'd like to just err tell the listeners a little bit about yourself and your work on technology in law and education**

ADAM WYNER: Hi David. Thanks a lot for bringing me into this project and all the discussions we've had about this. So, I am an associate professor of law and computer science at Swansea University and what that means in practice is that part of my position is in the school of law and part of my position is in computer science. I primarily have a background in linguistics and computer science, although all the work that I've been doing the last about almost 20 years now has been in artificial intelligence and law that is computer science techniques applied to legal information

**DAVID FOWLIS: okay that's great thank you So just to we start with a bit of background ....so what sort of education and training about legal technology and how you could use it to deliver legal services is actually available – and who is it available to, is it just students going through university or and is it just limited to higher education institutions at the moment?**

ADAM WYNER: there are a variety of programs in legal tech in the UK, Europe and the United States. and there are developments in for instance Singapore. It's still rather limited in scope. There are just a few law schools who are offering a programme and those are usually a masters programme or something like that. I'm not aware of substantive programmes at the undergraduate level that really incorporate a lot of legal tech. there's quite a strong difference between the programmes that are offering law applied to technology which is for instance 'how do you take intellectual property law and apply that to software.' And this is a topic that's been around for quite a long time so there's quite a lot of law schools that offer that. What's less is technology applied to the law - which is more like how do you do programming? What's computational thinking? What do you do about visualization? There are very few programmes like that. Swansea University has one, Stanford has some things going Suffolk university in the United States has some. and then there are also some summer schools that are offering programmes and it's sort of gradually taking off. A good listing if anybody's looking for this is Artificial Lawyer – he's got a page that's got a listing of who's offering what and that's worth a scan because you can see where things are. I do know that some law firms like Linklaters are just starting to develop legal tech training and I know that because I was participating in their development. There's not a lot going on – the point being that as far as I understand it, law firms don't have their own internal training programmes about legal tech. They're starting to develop these things

and farm these out to Swansea University law school or something like that. It's difficult for instance for smaller law firms or individual lawyers to access this kind of material.

**DAVID FOWLIS: for the education that is available, is there a general rationale behind it or does it tend to be quite piecemeal and perhaps focus on particular technologies that are in the headlines at the moment?**

ADAM WYNER: so I would rather contrast between ad-hoc and comprehensive and flavor of the month, so ...so the difference between flavor of the month and comprehensive is: take all sorts of specific technology and computer science, all sorts of specific approaches in artificial intelligence – which there are many and I'll say this again – or etc. and apply them to legal informatics right? That would be comprehensive. Whereas what tends to happen is people say 'oh we've got to talk about blockchain, bitcoin, distributed ledger, that's a hot topic it's so important and I've seen places that do focus a lot on distributed ledger. Or for instance you could focus on machine learning – Machine learning has been very successful in certain ways, so people gravitate towards these and there have been a lot of companies coming out and saying we're doing machine learning and we'll provide you with that service. So yes, there seems to be kind of focus towards these hot button topics. So they don't tend to be as comprehensive as I would think that they should be. The kinds of programmes that I tried to encourage and develop are more comprehensive – touching on more topics with more diversity of approaches, than focusing on the hot topics. I think that there's an important argument to be made for at least trying to approach things comprehensively rather than narrowly focused and the reason there is to avoid disappointment in terms of expectations. Because I think people in the AI community like me – we don't want to have what's called the AI winter come back, that is very huge expectations about what AI is going to do and then dramatic falloff in and disappointment because you didn't deliver. If we talk more in terms of a comprehensive, kind of distributed approach, incremental gradual over time – that disappointment will be, held off. For instance people are already saying distributed ledger, bitcoin, what's it done for me today? or machine learning, it's going to take away my jobs or it can't do this, or that. Why should we spend on AI? So comprehensive is I think something worth emphasizing.

**DAVID FOWLIS: do you think that the fact that there is this sort of inconsistent nature of technology education so far is really down to the newness of the topic? Is it.. is it just the fact this is new territory and educators haven't got their heads around it yet, or is it more down to the fact that legal regulators have said: 'okay, these are the things that we want lawyers to know about and you educators need start educating people about these issues?'**

ADAM WYNER: again it's not so much about whether its inconsistent but whether again it's this comprehensive versus hot topics kind of thing. I think it does have a lot to do with the newness, for everybody. Because there's the newness for the AI community itself – 'oh legal informatics, this is a new topic.' I am in a computer science department, and to get my colleagues engaged with legal topics and legal areas is really very, very fresh for them. I'm also in a law school. To get my law school colleagues and legal practitioners engaged in technology – also very, very new to them, very difficult., and a lot of this is a cultural disposition. We're talking about two very, very different kinds of communities, different

behaviours, agendas etc., trying to sort of mesh what they're trying to do. And, because its new, it makes it very difficult to say, well, what are we supposed to be teaching? And for the regulators, this is exactly where the problem is for them. They're sitting in the middle of this saying 'oh there's all this activity going on and what's the best way for us to make headway?' And I think in part, our discussion and the paper, is this proposal of what should be done. And I started to reflect on this and thinking, this is very much kind of the regulatory...a regulator's question: please tell us what should be done. Whereas me as a computer scientist had this much more experimental kind of...developmental point of view – trying to find out what the problems are in the first instance, and from that you make the solutions. So, in a sense, it's learning each other's language, how to set the agendas, and to some extent advice to the regulators is 'let's start exploring the domain and get familiar with what's going on and from that we'll emerge the kind of norms you want to propagate, rather than 'we've got to do this immediately and let's make the norms right away'. So I think it's not so much inconsistent as it is ..it is the newness, it is the dramatic difference between the communities and the way they are understanding things.

**DAVID FOWLIS: so if you're a legal educator, what are the challenges you're facing if you're going to start teaching the next generation or the current generation of lawyers about technology? What should you be looking teach them and what are the difficulties in doing that?**

ADAM WYNER: It's easier for me to draw on the experience that I've had in teaching AI and law topics both at Swansea and other places. the courses that I've been doing, we really kind of start with law school students, and they may never have done anything with a computer before. And they may never have looked at formal logic before and they may never have looked at case-based reasoning systematically these kinds of things. So, you have to introduce people to a certain kind of analytic thinking. And the way that I've come to look at this more as what we're calling computational thinking, which is not even touching the machine yet. People oftentimes conflate computational thinking in computer science with 'that box on your desktop'. That's actually not the most relevant thing. So, trying to introduce them to computational thinking which is a way of thinking kind of analytically about problems. You can do this anywhere in the sciences. But it's taking a large problem, decomposing it into its parts, the relationships between the parts, the processes that you want to apply to those parts going from where you're starting from to where you'd like to end up with, where there might be a lot of intermediate steps. we might call that algorithmic thinking; we might call it computational thinking... Another kind of area isa different disposition towards problem solving and problem exploration which is very common in computer science and I think is a bit different in law. you really have to explore problems in a rather different systematic way and you have to be more available to taking risk...more available to admitting failure. One of the things in what is it like to be a computer scientist...is you really fail a lot.

**DAVID FOWLIS: alright**

ADAM WYNER: you have to develop a thick skin to that because you can be sure, some bug arises, and you've got to figure it out. It's not quite the way people in law school think of

things. for instance when I have conversations with lawyers or law school colleagues, it runs along the lines of 'yeah but this problem is so complicated...in this way and that way, because that's interesting and fascinating with all the variations right?. A lot of times when you're doing science or computer science, you kind of want to get to the common elements. the things that occur most often and kind of put aside for a certain amount of time, some of those deviations from the normative course of things right?. Let's just get to the core of the behavior and then deal with the exceptions. Maybe we won't deal with the exceptions at all, maybe we'll just have to leave those aside, right? Whereas to a lawyer, that's really fascinating.

**DAVID FOWLIS: ...you're trying to encompass all the exceptions and trying to write something that's watertight all of the time...**

ADAM WYNER: watertight...exactly you know and you may do this you know...you're doing this as a legislator. But you're also doing this as a practicing lawyer developing a case

**DAVID FOWLIS: or writing a contract...**

ADAM WYNER: writing a contract. Well, you know we don't really do that when we do that in computer science. There are a lot of ways in which - so people in law are oftentimes very anxious when you are talking about how to solve a problem yeah but you're going to make it too rigid. And yeah, I mean this is an issue in computer science...is that you need to have this kind of decomposition to its parts and relations and step by step solutions. And there are things that you have to sort of leave aside because we need the thing to function. And so that becomes a choice. To leave aside what to work on and incorporate only certain kind of core things.

**DAVID FOWLIS: do you think that's why to some extent we've seen legal technology develop in some areas more rapidly in some areas...**

ADAM WYNER: absolutely

**DAVID FOWLIS: perhaps you've got things like document analysis software which has come on a lot and perhaps that problem solving methodology you've spoken about is more applicable there than it might be to say the more ... case determination software where you'd feed in a lot of information about how judges looked at cases to try and predict how a case might be resolved. do you think there are some areas of law where legal technology, technology's going to be more easily applicable.**

ADAM WYNER: so I think that there's an interesting discussion that would be worth having a panel about which is about that gradation. Because that's what it is - there's no firm cutoff but what areas and why is technology more applicable now than other areas, and in which kinds of ways. So just as another example is tax law. We've had tax law software for decades. Its available to the public. They don't think about it that way but that's what it is.

**DAVID FOWLIS: these things that you can use to ...**

ADAM WYNER: calculate....

**DAVID FOWLIS: ...put your receipts on and it spits out how much you owe to the revenue...**

ADAM WYNER: because they wrote the tax law in a very specific and clear way. And let me just give you a contrast ...the law commission has been very interested in automated vehicles. And they talk about some of the specific problems that have arisen with technology about automated vehicles, because for instance you can have a law that sounds really firm:— 70 miles an hour is peak rate can't you just build that as absolute hard line – hardcode that into the vehicle's code. Newell, then the law commission says yeah, but there are circumstances in which a police officer, a judge, would say there are legitimate reasons why exceeding the speed limit is fine. Rushing somebody to the hospital for instance,. There are lots of exceptional circumstances, and furthermore those circumstances are not firmly listed. They cannot be. So there's that gradation and I think what's interesting to me as researcher but also as somebody trying to bring technology into the marketplace, and in the hands of professionals is to find where those lines are and to ...define those things. And that's part of this kind of requirements engineering phase, right? Which we're really involved in at this point. What is it that we need to do? For what purposes? For which audiences? What's feasible to do? What can we set aside and not sort of literally you know chew off more than we can swallow?

**DAVID FOWLIS: do you think its...that legal education should really should be focusing on specific applications or do you think it should be more about general principles and getting lawyers to appreciate perhaps what technologies can and can't do? Or how technology can be best used and the limitations of what technologies can do?**

ADAM WYNER: so...I would certainly go for the general principles and not teach people very specific proprietary tools, commercial tools, because the main thing when you're dealing with education –is you don't want to lock in people. So, you have to teach people something that they can work with on an ongoing basis. But you also want to teach people concepts and techniques that are very highly likely to be reusable next year, five years, ten years down the line. Because there are sort of underlying concepts and techniques that will just be in place for ever. The other thing is that's quite noticeable to me is that when I look around at the legal tech landscape, I look at the various companies that I'm aware of and what the technologies there that they offer...these things are not new, in the legal tech community. There have been these concepts and these ideas and some rudimentary prototype technologies around some of these things. Yes, they make it work correctly and they distribute it on the web.. So, it's really to teach concepts that students can work with, things that faculty members can teach. what that general set of concepts is...that's another matter. And that's where we're trying to take these two very different areas and start to work them together more and more and start to converge on what are the relevant kind of things to be teaching.

**DAVID FOWLIS: so if we had to try and perhaps boil it down a little bit - perhaps when you want to teach a lawyer using an AI to reach a decision about how we proceed with a case, or deal with a legal question and the AI kicks out an answer that seems a bit odd.... do you**

want to make sure that lawyers have the confidence to question the machine? Because obviously there is the danger that potentially people begin to respect the machine too much,.... it's got access to a huge amounts of information potentially, it can run through thousands of scenarios in a way that a human brain maybe can't... but at the same time that might produce a result that you go ..wait a minute...that doesn't really make sense to me as a trained lawyer. Do you need to build in a level of confidence with lawyers about technology, but just how do you use it properly? To give it its due respect, but not be overwhelmed by it....

ADAM WYNER: so, I would actually go a bit further than that, and this is what I tell my students, which is that their role is to be critical Which is more I think than what you're saying... ..so I would like to think about teaching people enough of the fundamental concepts: where the data comes from, how the data gets processed, how do you extract structured information from the data, the potential for bias... how it is that tools go from data to some kind of result, and the potential for providing information that may be misleading. They need to be critical about how they're doing things, because otherwise people will get lulled, they will still get lulled into...'well its really making my life a lot easier', and I think we have to constantly be on guard to that. And let's remember it's not really just the machine – the machine is the end point of the organisation that has produced that. So really when we're thinking about maintaining some critical disposition, it's ...the critical disposition about how did that organisation get to provide this piece of software and What were their aims and purposes? And whose aims and purposes are they really serving and are those aligned with mine or the client that I'm serving? And I that's going to be more the user's responsibility, right? And I think we're in an environment now where we have so many apps..., we just use them and we trust that they work as they do...but even though there's lots of red flags about the technologies that we currently have, people are still just going along with this....like location on our phones –we know where the data is going for this, it's quite astonishing. We're all just going along with this uncritically.,

**DAVID FOWLIS: that's right....**

ADAM WYNER: I think that that moral is very much in place for legal tech. The potential for abuse is very significant that's something that the regulators should be guarding against, because they are kind of protecting the general environment, you know the citizenry, against abuse of technologies , of which there...we already know that there can be plenty of these...

**DAVID FOWLIS: Okay, so if you were to design the ideal legal technology training course, what would it consist of?**

ADAM WYNER: So, it's...a bit of a big question...because I could imagine a variety of different things,. But this is an act of ...a topic that I've been actively working on for the last bunch of years. and ...broadly speaking the idea is to take some aspects of computer science or AI...develop teaching materials....using those concepts and techniques that are relevant to law school students, because what's lacking now is – here's let's say talk about one topic: visualization, So, then you have to say, well, what legal content could we work with and how and how do we make it relevant and usable to a law school student. well, we take a bunch

of legal cases, we identify a lot of particular information: the parties, the jurisdictions, the cases that are cited etc. the legal principles that are applied. And we have our visualization across a large corpus of cases, and then say how would you as a law school student or practicing lawyer use this visualization of this legal information. Well, cases that are all kind of clustered together or highly closely related semantically in terms of content...that may be instructive to help you look at those cases to see whether your legal issue is being addressed in the cases that are linked. So that would be an instance of trying to draw together the techniques and the concepts from computer science, with the content of the law that's then useful for people who want to practice. Does that mean that they have to learn all of the math and all of the programming for visualization? Eh...not really. They should learn a little bit. It's always interesting for people to get their hands a little bit dirty and to learn that these things are very complicated. But it doesn't need to be the same as you know a graduate student. So it's always a matter of finding some kind of medium between the topic areas and the right kind of content that it makes sense to the law school students and they can see that that gets practiced outside of..... So, for instance there's a lot of work in computer science about logic and reasoning, knowledge representation and reasoning,; this is all over the law. I mean the law is filled with knowledge that has to be represented and reasoned with but how do you transform legal information into something that a machine can process? Well, some people have to go into that legal material and start to do very fine grain detailed analysis to transform it into something that is machine-readable and still represent what we understand about the law. Dispute resolution. There's a lot of work that's been done in computer science about argumentation and interactive chatbots for example, or dialogue representation for all sorts of different areas; but how do you take all this theory and all of these tools and look at what dispute resolution is or even legal argumentation is in court... and start to analyse that...use that in a course to teach it? you could talk about legal concepts: what's an obligation, what's a permission, what's a prohibition? And again, what does that mean in the computer science sense? So when I'm trying to sell these kinds of courses, I'll say to my computer science colleagues: we should do visualization or knowledge representation and reasoning, or data mining, but we have to work with not just this data, but also with these purposes, for this audience; and from the lawyer's side, the law school student's side, the law faculty' side, right. They will have to be taught about how you put data together analysis of data. the two other areas that you know I've been proposing is: one is this computational thinking –we just spoke about that; another one is to understand what's called the software engineering development cycle, and that's what every software engineer learns when they learn about developing a piece of software right?. These things don't happen by hacking. those days are long gone. The way it's done, there's a whole methodology; you identify what the problem is; you say 'Okay, how do we take this problem into its parts and what is it that you as the client, as the user, want to achieve; how do you want it to look and feel? Given this data in, what's that data coming out etc.? That's requirements engineering. Once you've figured out what you want to get, then you do a design. And you have to have a design about this whole thing before you go into actually doing the programming. You don't ever program anymore without a roadmap that tries to spell it out as much as possible.

**DAVID FOWLIS: you want...to know where you're trying to get to.....and you've got a pretty good idea of how that's going to go.**

ADAM WYNER: and how you go? Otherwise you will get lost and you'll end up with a lot of junk code, which we still see a lot. Then there's the actual programming; and then there's another phase of testing and evaluating; does this tool that you've built – given those designs, given those requirements – does this tool give you what the user – the expert that you consulted in the design – do what they want it to do. And then how you do maintain it? so one of the things I talk a lot about with students is: there's a place for you in the software development cycle; you don't have to be the programmer. You can be the legal knowledge expert interacting with the software engineer, who will interview you, and say: 'what is it that you want? How is it that you want it?' 'And you help them. You're part of a team? Then once you've got the requirements, you've got the design, you hand it over; they build some programming and they come back to you and say here's my prototype; is it doing what you think it should do? And you get to be the user and critique the hell out of it. And then you give feedback: One of the things that's very useful about seeing this cycle is the need for scope. If you're talking about a cultural difference between computer scientists and people in law, computer scientists are always trying to scope down the problem – look at it as you know an architect for building a building – and consulting the client. What the architect wants at the end of the consultation process is the design for the building. They don't want the client coming back and saying 'ooh I'd really like an extra room over there So, we need to scope things and that's part of this systematic way of thinking. So there's computational thinking, there's how you approach the methodology to development. And I think all of those things can and should be done.

**DAVID FOWLIS: one thing is around ethics and concerns that lawyers often have around making sure they're acting ethically as well as effectively on behalf of their clients... how does that fit in what you talked about...in term of relationship between a lawyer and say a computer scientist interacting with each other perhaps in the design of a legal technology application?**

ADAM WYNER: absolutely. So, the last two years...there's been a lot of discussion about regulating AI or responsible AI, or these kinds of ideas. you know there's one in the paper I discuss, one particular proposal that's based on kind of a global discussion about what is responsible AI. and also the UK government is very interested in this topic: what is it that they should do in order to see that AI doesn't get out of hand and does what it's supposed to do, and doesn't introduce bias. We've all heard the stories about face recognition;. What's happening with your health records? What's happening etcetera? We all know this is going on. So, what's happened fairly recently is that in computer science itself, they're very concerned with being seen to train computer science students in this notion of 'what's responsible AI.' So they need to know, at least as a matter of concern – what is it to be ethical? What kinds of properties should they build into their software? Whether it's transparency or explainability. There's a huge concern about what's called explainable AI – because we have all sorts of machine learning tools that are doing automated classification and we don't really understand actually technically why. For the law school students, I think exactly the same issues hold – and they have to be told very much the same kinds of things. So now I have a lecture for instance on responsible AI, to give both the computer science students and the law school students to say: here are some of the principles that people are talking about. what is it to be ethical? They talk about not introducing bias into the data; to make sure that your systems are transparent and explainable; what's the value of open data

and open source software in that sense, because it's accessible to examination and these kinds of things.

**DAVID FOWLIS: So, let's look at this from the regulator's standpoint. If we know what we'd like legal technology education to cover and what lawyers what lawyers are going to need to know, then how do the regulators ensure that's embedded into legal education?**

ADAM WYNER: In the paper, there are several propositions, right? And so, the question there is: how do these propositions get activated from the regulators point of view? So, for example there's this point about standards and openness of legal information – so open access to data, and open legal processes and things like that; and I'm specifically talking about for the purposes of education, right?. This is not intended for industry standard but for the purposes of legal education. What that means for the regulators is that they have to promote actively open data and open source software. What does that mean? That means either they get on board with some of the open data platforms out there – because this issue of open data is a very lively issue in many domains;. So, they can support and engage with that open source software, they can engage with that. And again, there are organisations that are very involved with open source software or open source standards. The regulators could actively engage in standards construction –convening groups of people, interested parties, to have standards for their particular subsections, involving their members; they could also for instance – about open data – they could say: we don't want your client list and all of your internal processes – we're not asking for that. We could ask legitimately for a sample Make a contribution for the greater good – for the future of legal practice, right – that is anonymized. We don't want to know your personal business, but we want to know some of the shape about the stuff that you've got going on. Give us the narrative about the legal processes within your company. Why? Well, one argument there is do you really think that if there are a hundred companies more or less in the same -- industry, do you really think that they're all doing everything radically differently. Probably not. Probably there's a lot that's shared in common. So, let's just open that up, right: Keep something that's really proprietary and different to yourself. But for the common processes, let's try to make something that actually is the common good. And the same thing for software development: There's no reason not to have some encouragement towards you know common development of tools that you know useful to their particular communities. The advantage for the regulators in doing that is that they know who they're working with, they know all their subsectors – because it's not going to be one tool for the whole thing. about responsible AI, the regulators could say that these are the values that are important to us – and they could do a consultation among their members; But they could take an active role in those consultations and promoting those kinds of values and those kinds of principles in the legal community, rather than having it forced from the top downwards by the government, right?. The government says: anything that involves this kind of technology must adhere to the following principles other kinds of things you know are: we just talked about hybrid courses and programmes in law and computer science – and that's again, you know, what regulators can do is convening panels, engaging me, with me is very nice and that's very interesting, but they could also take the role – take the lead – of engaging panels of computer scientists across the spectrum right? For the integration of legal services and government legal services – we haven't talked much about that – but the government is increasingly driving towards its own technologies to serve to serve government services to

the public – and to itself by the way; It's also very interested in providing its own data about the public and public services and functioning of government to either other organisations, legal professionals, or the citizenry., and they're also very interested in responsible AI; and the judiciary is also has been notable in their billion-pound investment interested in technological development – they're not quite in the AI space but they're moving in that direction. So these very large scale organisation – *the* large scale organisations, are inevitably going to have an impact on the regulators, as well as the law firms and the lawyers, because all the legal information that they're already working with interfaces with the government and the judiciary. So they can play an active role in shaping what those technologies are and how that data is made available, rather than simply being the recipients of the structures...

**DAVID FOWLIS: because one thing we've picked up and sort of have been doing is that – you have the legal profession– and medical and financial, and general business – and in the past, probably legal regulation's been self-contained and medical regulation has been self-contained, but now you have a technology like AI which can sit above all this, can have a general application outside of the professions –each profession might have slightly different concerns about it– say in law – we may be particularly concerned about explicability; we might be more concerned about it than say in medicine just for arguments sake – because medicine may just care that it works**

ADAM WYNER: We have cases of this in breast cancer detection. Machine learning is able to do a much better job. Does anybody really care? They just want it detected. They just want it to work which is great!

**DAVID FOWLIS: they just want it to work.... whereas for us perhaps, in law, you may be more concerned that you understand why so that you can then use that to make further decisions... ..**

ADAM WYNER: I mean can I just underscore this? I think that actually in law it's more necessary than almost any other area and I make this argument a lot; because there's no such thing as making a decision on a case that may go on appeal without knowing what's the basis of the appeal; and for that you need to have detailed knowledge of the case that's going on appeal. So, it's just an instance but I think for law it's important.

**DAVID FOWLIS: so if we just maybe just maybe just bring it back and sum up a little bit here. So if we're a regulator, we're looking at what sort of legal education courses we want to see for about technology, what we want our new lawyers and our current lawyers to know, What are the things maybe three four five things that we really want to see from legal education course, and that we should be making sure is there?**

ADAM WYNER: well so I would put this rather ...fairly high level points, because it would be if I said, 'well you know you need to do this topic in machine learning and that topic in knowledge representation', I think that would actually would not serve any point. But I think going through the computer science topics and to figure out what's enough knowledge from that domain....that is acquirable in the course of legal education. So, the scale and scope of things is really going to have to be relativized. You have to know something about the law

and something about computer science. So, one is start to figure out what's the scope of things in computer science. The other thing is to figure out what are the topic areas? What are the good examples ...to work on – and for that people you know – frankly like me and my colleagues who are interested in this interdisciplinary area have to have the opportunity to work across those fields so that you get the right level of mix.. Another thing is this matter of having open source data and open source tools to work with because we need to work in an unrestricted manner. Both for the sake of the educators and for the sake of the students; and the more realistic the data is, the more I know for instance as an educator about the problems that lawyers have and how they look at the data, the more I can make that course relevant to the law. If there's a big problem for me – the last twenty years – it's been: where's the data? What do you really think about the data? And will you help me structure the data in a way that I can process it, or I can teach it or something like that. There's a certain amount of people in the legal community making themselves more available...to participating in the development of legal technology education. I think that would be very important. I think that the regulators could encourage people. this is something that's going to be rather important to be moving the whole legal tech agenda forward; and I think the people who participate in that process will get some things out of it as well. I think the critical disposition towards the application of technology to the law – I think that really needs to be encouraged and maintained, but that also takes a certain amount of education and knowledge about what is the technology, how does it work, what does it mean to us? I think that going forward is going to be kept in mind. The this disposition of just being enthusiastically accepting – 'uh machine learning, wonderful!' – that has to stop. It's not actually helpful to anybody, because people will just talk about it in a way that's not appropriate– for me the longevity of this project is much more important than who's going to be doing what in the next one or two years, and I think also the regulators need to be looking for the long course of this. It is going to happen. It's really an inevitable just development - so, making some longer-term plans, and not just having kneejerk close-time reaction, is helpful.

**DAVID FOWLIS: Can you think of where there are larger lessons we can learn from other sectors that legal regulators could start applying?**

ADAM WYNER: well let's look at this issue though again about the cultural differences. Because I think that's kind of the ground of where the issue arises about this. law starts out being prescriptive, by nature. The sciences or even mathematics they're not prescriptive, they're either highly empirical or they're very theoretical. They're very data driven you know, there's a whole scientific method . And actually, the scientific method of developing a study and understanding some phenomenon is very much like the software engineering cycle. So I think that there needs to be some kind of self-searching about those kinds of cultural dispositions and the extent to which those cultural dispositions are compatible with the current developments in legal tech –.. Another aspect of this cultural difference is lawyers are trained to argue in a certain style, with certain goals That style of argumentation – those goals and those methods – are very, very different from what goes on in any of the sciences or in computer science, right?

**DAVID FOWLIS: So do you almost need – you need to teach lawyers to think a bit differently – and even if they need to think as a lawyer in certain situations, they'll need**

**to understand how other people - computer scientists and people developing software applications thinks – partly so the lawyers can interact with them and get what they need...**

ADAM WYNER: so, they can do that, they can get what they need out of it

**DAVID FOWLIS: and they can understand how they're using the tech...how they're using the technologies properly**

ADAM WYNER: yes, how they're using the technology properly – and also for me as a researcher, part of what's exciting about what's going on now is the opportunity to kind of apply this scientific method to the law itself. There's the beginning of an opportunity to explore the law and understand the law in a way that's different to what we've often had which is this: somebody made the law and that's the way that it is –It may not really be, so I think that that kind of beginnings of explorations has quite interesting opportunities to it.

**DAVID FOWLIS: Adam thank you it's been a really good discussion, it's covered a lot of ground. Is there any one message that you'd like to get across to legal services regulators about technology education for lawyers?**

ADAM WYNER: there's a tremendous opportunity. We're at the beginning of exploring what can be done and how it can be taught, and what tools will be on offer. there are areas, in the sciences, or in computer science itself, where things were just getting going and then they started to blow up let's say bioinformatics....Who knew that biology and computer science would be put together and then we could find you know new cures for a virus by applying these automated techniques. legal tech is really at the very beginning of that kind of growth phase, where there's a lot of opportunities...a tremendous amount of diversity...you know some ambiguity and some concerns about who's going to get what, but from my point of view, as somebody who does research and development and teaching, this is very exciting, and people should engage with this and not be concerned about what they have to lose. They really have only things to gain.

**DAVID FOWLIS: okay thank you very much**

ADAM WYNER: thank you for having me.