InTransition Episode 109 - John Allsopp

David Pembroke: Hello, ladies and gentlemen and welcome once again to InTransition, the podcast that examines the practise of content communication in government and the public sector. My name's David Pembroke and thank you for joining us once again. We've got a great guest this week and what we're going to be doing this week is really looking at the web ... Changes in the web as a publishing platform and how, in fact, we can take advantage of those changes in order for us to be able to communicate more effectively with citizens and stakeholders. But before we come to my introduction to this week's guest, we start with the definition as we do each week.

So content communication is a strategic, measurable, and accountable business process that relies on the creation, curation, and distribution of useful, relevant, and consistent content. The purpose is to engage and inform a specific audience in order to achieve a desired citizen and/or stakeholder action, so there we go. So to my guest this week- it's John Allsopp who has a background in computer science and mathematics which, to me, seems like a great combination to have at this time, as computer science and mathematics really starts to take hold of the communication area.

For nearly 20 years, he has developed software for web developers, built websites, applications, written articles, tutorials for print online publications. In 2000, he wrote A Dao of Web Design, which over a decade later continues to be widely cited as the theoretical foundation for responsive web design. He is involved in all sorts of things including, web directions conference series and all the time that he spends or the free time that he has he lives in a lovely little part of Sydney, or just outside of Sydney, in a part where he is able to look out over the ocean. So it sounds like a fantastic place to live and he joins me from there now. So John, welcome to InTransition.

John Allsopp: Thank you so much. Thanks David, I am actually in my office in Surry Hills, which is a little commute from Bundeena, yes.

David Pembroke: Oh okay, so you are down in Bundeena, down in the southern part of Sydney?

John Allsopp: That's right. Just in the Royal National Park, so it's a great place to be.

David Pembroke: Dude, so you live in the Royal National Park?

John Allsopp: Yeah, that's right. So there are a couple of little towns that are actually surrounded by National Park.

David Pembroke: Yeah. All right, okay.

John Allsopp: Just on the north end.

David Pembroke: Yeah, and Bundeena being one of them?

John Allsopp: Yeah, that's the sort of big one that most people probably know of.

David Pembroke: It's a spectacular part of Sydney, isn't it. We've got a lot of listeners from all around the world. I think to understand Bundeena and that beautiful part of Sydney, particularly coming from out of town when you fly out from Canberra or you fly in from overseas. It's just that little bit that's not far outside of Sydney and it's absolutely majestic.

John Allsopp: Yeah, it's so close to the city itself in a lot of ways. People commute. It's a long commute, but a good commute. And as you say, a lot of people fly over it. It's just out off shore. If you sort of flying north into Sydney and you look over the port out to your left, you'll see the Royal National Park, its beaches, and then you'll see Bundeena. So flying in back home or flying away, for that matter, I see it all the time. It's either welcoming me home or I'm feeling sad as I leave. It is a wonderful place to be. Right now I am in Surry Hills, which is in the heart of Sydney.

David Pembroke: Right in the heart of Sydney, indeed. As I said, many people listen to these podcasts when they are driving in their cars and I can imagine someone sitting in traffic in San Francisco at the moment, sitting there thinking, "I wouldn't mind being in Bundeena right now." Obviously being down there and having time to reflect ... Where is your head at at the moment, in terms of the changes in the technology and how communicators can best use those changes in order to create the relationships they need to support their government programmes, services, regulations, whatever it is, whatever that story is they're trying to tell.

John Allsopp: Right. So look, I guess where I try to live, and I have for many years, is sort of thinking about what comes next. The world is full of futurists. And a lot of the ways we predict the future are pretty bad and that includes massive corporations who build extraordinary products like Google Glass that end up not really being the future at all.

It's a kind of interesting, but also challenging place to be. And I think a lot of people, when they think about the idea of futurism and think about the future, they kind of roll their eyes and sigh. I think that's a lot of time very fair, but it is something we do a lot of. Partly because we put together these conferences and we try to bring in people who can help inspire others to think what does come next. So it is something I think about all the time. And I tell you there are a couple of things that are really interesting me now and I think they overlap very strongly with communication. Because , look, if you think about it, at the end of the day, the entire point of ... Well, not just the web, but just about everything humans do is really just about communicating right?

And there's an interesting thing because we communicate with other humans often mediated, increasingly mediated by machines. And we communicated

with the machines themselves. I think there are some very interesting things happening in both those areas that I think people should be paying some attention to. Probably some of these things, people have been thinking about a bit. I'm working on this idea that I'm going to be talking about, funny enough, in San Francisco or just outside at a conference in a few weeks there. It's a conference about front end developers. So it's kind of very technical, but it's called Fluent and it will be in San Jose.

And the idea is what I call the end of personal computing. And there's a long story around this and we probably don't have time to go into all of it, but I guess the idea is that we've seen a number of waves of computing over the last 50 or 60 years, right? The mainframe and then, the medium. David, you and I ... You probably remember, at least partially some of that. And I certainly remember the rise of the personal computer. I, literally in my early teens, remember when personal computers ... I'm talking pre-IBM PC became a thing.

And so, I think for the last 40 years probably since ... You can probably start at around '76, '77, with the rise of Apple 1 and the Sinclair and the Tandy TRS-80. We've had this fear of personal computing. And the mobile phone we all carry in our pocket and hold in our hand, and it's never more than centimetres from us at any point, is still really part of that ongoing wave, that paradigm of computing.

So what is that paradigm of computing? Basically, it's a piece of glass that we look at and that we input data into by typing and that we read data from. The modality hasn't changed in a lot of ways, right? Yes, there's a little bit of voice and there is a little ... But at the end of the day, how we use the Apple 1 and how we use the iPhone 7, or fill in whatever blanks you like, is remarkably similar.

David Pembroke: Yeah that interaction. At the interaction point with the computer. It's not a whole lot different, but obviously the network effects or the ability to connect to much greater forms of rich media is obviously much different.

John Allsopp: Absolutely. So in terms of the human computer experience though, it is very, very similar, I should say. We've had these extraordinary increase in the potential of our network, so that we go from a sort of 900 baud modem that can kind of barely keep up with typing through to the sort of streaming that we get from the likes of Netflix and so on. Those things are profound changes, but I ... You can still essentially wrap them up in a single paradigm, in many respects. And I think I would summarise that all, above all, by saying, "Computers are really dumb," right? They literally sit there, waiting for us to click or tap or type or give some sort of command and then, they respond to it. But if you think about it in these terms, we are slaves to it, right?

They won't do much of anything for us unless we tell them what to do and in many ways, how to do it. And so, to me, this is a really interesting phenomenon

in that we call it personal computing but in some ways, I see it as very impersonal, like depersonalising. Because most of the time humans ... Or a great deal of the time, humans spend with other humans. We talk and we communicate in all these different subverbal, nonverbal, visual ways and so on. And yet, as soon as you put a computer into that mix, it completely interrupts the human component of that. We've all pretended to have a conversation or some sort of relate ... Some sort of ongoing relationship with a phone involved. And the moment somebody pulls out and say, "Oh, I'm just checking depth ... I'm just checking ...", the conversation's almost finished, right?

And yet, if you think about it, 10 people can sit around a dinner table and conduct multiple conversations and pick up threads and leave them behind, and that's perfectly natural. We're really good at that. But as soon as we look at a screen, and especially to try and decipher little squiggles and turn them into words, we are using so much of our cerebral cortex in order to do that that we basically shut out the rest of the world. So this is a long and rambling bit obviously, but I'm trying to set up the idea that computing kind of stops the moment we start a relationship with something else, right? Unless it completely mediates that relationship. Unless it's us texting one another through the medium, the computer.

So what I'm really interested in is a couple of things. Well, one of them is the ears. Now, we've long had this obsession with the audio. The next computing paradigm is we're going to talk about computers. Like, obviously the likes of Siri and Cortana and Alexa now out of Amazon- a really interesting phenomena. But to be quite honest, I've always been sceptical that they will become general computing paradigms. I'm much more interested in computing that sits in our ears. And a famous example recently is the film Her by Spike Jonze that kind of explores, perhaps a little bit extraordinarily, the idea that people might fall in love with some sort of virtual agent. But I think a lot of the human computer interaction stuff that's in there is really, really interesting.

And if you start thinking about devices like Apple's EarPods, which have been a phenomenon. You used to wait weeks to get a pair from them. I think that might give us a hint toward where some of the human computer interaction is going. It's not to say we're not going to still use phones. We're not going to still use our laptops. But in the same way we still use mainframe for what we used them for 30, 40, years ago. I think we'll use personal computers in the sense we have them for- creating content and consuming content in the ways we currently do. I think we'll start seeing computing and computer interactions permeating far, far more.

For many years, we listened to radio. But radio was very much constrained by licencing laws and a whole bout of technical constraints. You can only listen to a small number of things. Now you can literally listen to anything you'd like from anyone in the world anywhere you are. And I think that's a little example, perhaps, of the sorts of changing which we're going to see, distribution

information. But if you imagine, if we've always got a computer that's potentially able to talk to us ... I think there's something really interesting around that. So that's one of the big macrotrends. I'm not saying tomorrow afternoon that's going to change everything we do, but I really think there's something very interesting in that.

David Pembroke: So that's in terms of how people receive information and interact with information, you said, through the ears? Is that right?

John Allsopp: Yeah, so if you think about it like this: There are a lot of people who have computers embedded into their heads that help them hear better, right? Now, is there any reason why ... At the moment, this is restricted almost entirely to people who have some hearing loss, whether it's congenital or however they got that loss. But why doesn't it make sense for those of us who have reasonably good hearing already to perhaps have it improved by some sort of implant. And then, once that's there, why can't it constantly be able to communicate to a network and provide very context-based information. Obviously, we want to be in control of it, right? But, you know, give you a heads-up about something that's happening around you as you walk down the street, by way of example, or reminders of things that you need to do.

A lot of the things we use mobile devices for now ... We pull them out of our pockets or increasingly, at least Apple thinks that we're going to look at our wrists for reminders about things. But why do we need that device to get between us and ... Why does it have to work like that? So I'm very interested in what happens when people ... Now, we don't even necessarily need these things embedded into our ears. I think Apple's EarPods, they call them, are a good example of a pretty unobtrusive, very powerful device that we can kind of leave in our ears most of the time. Yeah, it's kind of early adopted days and you probably look a bit silly doing it to some extent, but I think it's a kind of hint of what might come next.

And then, so as people who communicate who, when you think about communication ... How do you communicate with someone who's kind of always listening. Now, you obviously don't want to bombard them with the information. What is the right amount of information to really help them improve the quality of their day? That's a whole avenue, I think, that we've barely begun to think about in terms of communication strategy. To me, it follows from this observation that I think people are going to have their earphones in more and more of the time. I mean, kids grow but young kids, they spend half of their lives with earphones in, right?

David Pembroke: So it's not the Elon Musk sort of transplant device that you're sort of looking towards. It's more being able to-

John Allsopp: Yeah, and like I said, that's a good observation you make around that because I think there is something ... It isn't entirely dissimilar. It's that idea of the neural

lace that Musk has been talking about. So if you think about what's the path there and whether ... And I'm not entirely sure that's a great place to go, but that's a whole different issue. But a long way short of going all the way there, we can augment our brain having ... We were to do it, right? Like, Musk makes the observation that phone is an extension of our brain. It gives us access to the vast sum of human knowledge. The challenge in part is that there's a friction around getting access to it. Notice we'll pay ... You have to pull a device and go through the process of kind of accessing that information.

So yeah, I see it in some ways as a step in that direction. It may be a long way from that, but it does really interest me. How do we take our interactions with computing beyond where we're able to do it now? And what's the limiting factor right now? If you're looking at a screen as you walk down the street, people get hit by cars, by way of example. So there's this sort of ... Or when we're having a conversation with someone, pull our phone out. I would argue it's not simply a cultural problem as to why that gets in the way of conversations and relationships, I actually just think the way our brain functions, we simply can't multitask when we're trying to turn squiggles on a screen into words. It's using too much of our cerebral capacity in order ... 12 hours to have an ongoing relationship with someone at that moment.

David Pembroke: I get where you're coming from, because I think there is this ... And where we get to and how fast we get there and what people are prepared to accept and not to accept, in terms of that interaction with communication. Because even, as you say, the phone as it is at the moment sits not too far away from us at any given point in time. The phone and the screens are now coming to people's bedrooms, where people are sitting up at night watching Netflix. And so, the impact on people's relationship through technology is happening and it's happening anyway in just day-to-day interactions. But then, it's tried to anticipated what level, I suppose, the development of social morals and acceptances and other things. Because I think the technology will get there a whole lot faster than humans will, in terms of their acceptance of it.

But then it is, I suppose ... To understand what is that next step in the next three, four, five years that can give people who work in government communications that understanding of where the areas that they should be perhaps applying their attention, because every galah in the pet shop is talking about virtual reality, artificial intelligence, machine learning. But where in that next period of time do you see this change moving to that would be ... Better prepare someone to become a more effective communicator in the next sort of three to five years?

John Allsopp: Right, so what I'm talking about there, I think you've made a good observation, is quite speculative and something, I think ... It's always worth people thinking about longer term trends, but it's certainly I think probably at the far end of the window of time you've given me. The thing that I'm really interested in, and you've touched on a few things. For the moment, what are the hot things

people are talking about? They're talking about VR, right? I think we can have a long conversation about whether there is a there there and what that there is. And-

David Pembroke: I'm not sure. I get it. I can see it. But in the next three to five years, I'm not sure that there's a direct application that you're going to be thinking, "Okay, we must have that as part of our armoury," in terms of creating engagement with citizens and stakeholders.

John Allsopp: Yeah, I would caution anybody in this current timeframe to think about “Second Life” and the investment and the excitement ... You remember that, though.

David Pembroke: I do, I do.

John Allsopp: Remember like the ABC investing monstrous amounts of money …

David Pembroke: Telstra? Everybody was in there.

John Allsopp: Right. I would caution people to think about those terms, right? And I'm very happy to continue this conversation with anybody over a cup of tea or at any capacity. And so, falling into a similar bucket as that, to some extent, is augmented reality. I would suggest and I won't go on much more about this ... I would suggest the way which a lot of what we expect augmented reality will do for us. What actually emerges will be actually through our ears rather than through our eyes. So that's sort of ties into what we've just been talking about. I think a lot of the value in augmented reality, which is kind of layering information on top of the world as we move through it, actually probably works better orally rather than visually. But I think that's speculative.

David Pembroke: So that sort of thing you mean like walking past a particular monument, for example ... Say for example, you're in Canberra and you're visiting the War Memorial, the augmented experience could be someone taking you through ... And not for you having to sort of purchase a walking audio tour but something that your computer would immediately understand where you are, what you need to know, and you could, in fact, engage with it through your ears. And obviously, records as well.

John Allsopp: Absolutely. Right. Even often, simply by moving through a space, right? So there's a whole lot of things to consider around years of experience and how we take the context of where someone actually is right now and what they seem to be doing. And we can do that. You know, all these accelerometers and driver scopes and geolocation in pretty much every device and so, we can ... Deal about someone in their context in that way. And the other thing I think is really important for the ... To observe that all new technology is that ... We get this enthusiasm, whether it's about second life or whether it's about VR right now, but the challenge is that ... Where are the use cases? Where are the things that are demonstrating the [inaudible] ... I think the observation you made is we've

been doing for 30 or 40 years ... We've been getting these little audio tours and people do them, and they provide value. So we kind of know there is something there to explore.

I didn't want to derail back onto that path around AI, but I think that's ... I mean, and there's very specific use cases in that, but there's something to explore there. But if we come back now, perhaps, to something more in the wheelhouse of your particular audience around government communication and public sector communication and so on. And you alluded to AI, right? And so, I think this is really ... If there are a couple of things that are really exciting me and they go together. The one is kind of what happens when we listen rather than look and the second one is what we're doing with artificial intelligence, machine learning. Now, that's been a theme for a long time. I mean, you alluded to my university degree. In the 1980's, I finished ... I think I finished my computer science degree in 1988. And one of the things that drove me to do it was AI.

And we got to third year and it was an elective. And it was all about hill climbing algorithms and all this kind of stuff that ... That was not what was interesting me. Now obviously, that interests really smart people and they've been working on that sort of thing for 40 or 50 years, going back to the early 70's with Marvin Minsky and his work back there. But what's interesting to me now is that we have this whole layer of very accessible machine learning and artificial intelligence toolsets out of the likes of Watson from IBM. Amazon web services have things that are ... They have a thing called Lex, which is essentially the open-sourcing, not just open-sourcing but providing as a service the same engine that's driving Alexa. They have a speech-to-text and text-to-speech, simile Google cloud platforms, simile Microsoft with edge and then, a whole range of start-ups, as well.

What these do is they make the barriers to entry, to the very least exploring the possibility of adding intelligence to existing products as well as creating new ones, really, really low. I see this as the sort of ... The analogy that I sometimes use is the sort of Apple 1 of artificial intelligence. It's where we're switching from the mainframe of many, where you needed heaps of resources and super smart people and loads of money to use computing to ... As teams and individuals.

David Pembroke: So, could you give me an example of a use case, though, today? As you say, there are these tools available. Watson's available. Lex is available. All sorts of artificial intelligence applications are there available, ready to be used. How might somebody start this journey on using artificial intelligence to achieve ultimately what is the mission of public sector communicators, to strengthen communities and improve the well-being of citizens. What sort of applications could they use today that would help them to achieve that outcome?

John Allsopp: Right. So you can do some very, very simple things relatively straightforwardly, right? So imagine the recent challenge that Suddenlink has had with a great deal

of concern by many folks about the potential of overpayment and so on. So we're all aware of that. I think it's kind of probably going to be a case we talk about for many, many years. One of the challenges and what's been ... The insurance industry is kind of exploring this, right? Let's suppose a large storm is bearing down on a location. The insurance industry knows they're about to be, to pardon the pun, deluged with inquiries and claims, right? And right then and there is the time they make their money, because this is ... Even though, they spent it already. Because this is the thing that people have been trusting them for for many years.

And so, insurance companies know that they need to really make sure that those people who have been through this harrowing experience get the service they need, they get their claims dealt with. And traditionally, this has scaled as a function of the number of people who can answer phones, right? So humans don't scale very well but increasingly, humans are pretty comfortable using computers, mobile apps, and so on to interact with all kinds of services. So the insurance industry is very strongly exploring and using a technology we roughly call chatbots and the problem with that term is that it's kind of ... I think it's rather stereotyped.

I think we've already got preconceptions about that and we've all used Clippy. And we have an idea that it's a pretty boring and actually annoying technology that doesn't really work but the truth is, in the last couple of years through a lot of these AI technologies, the ability to create and deploy specialised chatbots in this sort of environment has become very, very acceptable and it works pretty well. And I would say within the next couple of years, it's going to become extremely ... It's going to work extremely well because the thing about machine learning is the learning part, right? The more a robot, chatbot or bot, does something, the better it gets at that thing.

So I would say, for example, where government folks get a lot of inquiries, especially if they spike around certain times of year or certain events that occur, exploring the way in which things triage and communications ... Even if it's not a robot that replies to someone, getting an email or someone fills a form or some other form of communication, even verbal. They leave messages on phones. That can be converted from speech-to-text very well these days. And I would say in a couple years ... Already, there's a lot of work that suggests that, at least at the stuff that's starting to leave the laboratories, you're getting as good as human stenographers are at this.

I've seen these examples of using, in triage of emails, so the deluge of emails. Which are the ones that we need to reply to, in what order? We're getting hundreds of thousands- tens of thousands of email communications or web forms being filled in. I think a big part of it initially is simply working out who needs to be responded to, in what order. And there's a lot of work around that that's occurring. And then, I think, as I suggested in the insurance industry, basically utilising ... Let's call them chatbots. I'm not comfortable with the term,

but that's what people use. Utilising chatbots in order to, perhaps, deal with a nontrivial percentage of the kinds of inquiries that people have. If you can maybe have 10 or 15% of the inquiries that would normally go through to a human answered by a bot that the person's happier because at 2 am in the morning and they've had their problem solved. They just needed some solution that was relatively straightforward or at a peak time, they go away.

Then, you're saving money, you're creating a better user experience and if it doesn't work for them, the next fallback is perhaps a human that they chat with, ultimately falling through to a phone call. So I think-

David Pembroke: And ultimately, the payoff is not only a better experience and better service, but it saves tax payers money.

John Allsopp: Right, so whichever way you want to slice it and dice it. If you want to look at it from the perspective of saving money, there's a case there, absolutely. But I think, to be quite honest, if we start with a perspective and we've seen this a lot with the work at the government digital service in the UK, US digital service and obviously, DTA in Australia. Although we're trying to get the delivery of government services, not just digital ones, as kind of being human centred. So it sounds kind of ironic, in a way, that we might use robots to make human centred experiences better but in at least some nontrivial percentage of the time, that can be the case. So this is kind of really low-hanging fruit. There's nontrivial cost in developing some of this technology, but it's not ... Literally, it's not rocket science. It would be rocket science five years ago in one way.

So you would be employing teams and machine-running experts and getting huge datasets and so on. These days, a lot of this stuff is very, very accessible and certainly with even the kind of regular government budgets that we see around projects. And it relatively falls into those sort of budgets and, as you observe, there are direct measurable cost savings, in addition to you creating a better experience for your citizens and other people who use your services. So I think, to be quite honest, right now, the opportunities to deploy this technology are extraordinary and I just ... If I was a little bit younger, I think it's probably what I would drop everything and focus all my energy on.

David Pembroke: Well, who knows? You might be able to implant some chip. We could live ... I think we're all going to live a whole lot longer than our grandparents and our parents. And I think our children will live a lot longer than we will, as well, as they come to hack themselves and live forever. But it's a fascinating challenge, I think, for people working in government communication is to accept the challenge of technology and really ... Often people are in this space because they didn't like mathematics and they don't like computer science, and they find all of that stuff a little bit scary. But I don't think that there's a choice these days, so I think we all have to accept that we've got to learn more. We've got to accept more. We've got to try to understand how do we put the citizen at the centre of our considerations.

And as you've just very articulately outlined, if through technology such artificial intelligence driven by machine learning ... If that can deliver a better experience, while it's encumbered upon us to understand that utility and to deploy that utility in service of the community. So as I say, I know it's hard for a lot of people and I've had that feedback from a number of people who listen to the podcast that this stuff is hard. But I think it's very exciting at the same time. And you outline some very thought-provoking concepts there and I'll go away and think about my ears and think about whether or not I'd be ready to implant something.

Whenever I listen to that neural life stuff with Elon Musk, I've always thought, "No, I don't know if I could go down that path." But where we start, where we stop, what's going to happen but just even, observing the changes that I know in my own habits. So I think it's rapid. It's compelling. It's something that we really have to pay attention to, isn't it? The dramatic change that technology is going to have on our individual lives, but also the life of the communities, as well, that we serve.

John Allsopp: Absolutely. Another observation I would make about your concern, which I think is legitimate around people who are ... Sort of had bad experience with science and technology growing up is ... You know, I think the important component here is that we can develop all the technology in the world and Google glasses are, I think, a perfect example. What we need is to turn them into products. I guess that's the term we use. We need to turn them into something that solves human problems and I think this is where design in the broader sense comes in. I have a little analogy, which is just technology plus design equals product or solution. We see so many technologies, we try a solution in search of a problem. And I think this is where it's encumbered on people who may feel intimidated to some extent around technology or the deeper aspects of it to actually explore what they allow us to do.

And this is why I'm particularly excited about this sort of what I ... Some people refer to as AI as a service. These AI services that you essentially kind of explore and use and they're all ... All the hard work is being done by IBM and Amazon and Google and Microsoft. They're essentially the very high-level technologies that you couldn't even apply with some of the translation and other API's. You can literally take a blob of text and place it in a box and it will get you back the result. So you can even explore what these technologies can do without the slightest bit of implementation of any development ever. So I really implore people to go and just start exploring what capabilities there are from these various platforms because it doesn't require mathematics and so on. My analogy, to some extent, is the kind of rise of WYSIWYG and the Mac and Pagemaker and these sort of desktop publishing tools in the late 80's that really revolutionised and democratised content production distribution.

That's, to me to some extent, just sort of where we are with this now that if you go back before the late 1980's in order to create a publication ... And I'm sure

some of the audience here were part of those days. There were a lot of very arcane technical skills that you needed, whether they were cutting pieces of paper up and sticking them on surfaces or whether they were these Letraset style kind of command line interfaces. And then, the Mac ... And the various desktop publishing software came along. Photoshop came along and allowed a whole new generation of content creation to flourish and I sort of feel that it's a semi kind of revolution.

So if you're a content expert, or whatever your field is, I think people should start thinking about, "Wow, if I can do this, what would I do with it?" Because it's not science fiction anymore.

David Pembroke: I can tell you it's not. Well, John, thank you very much for giving up some of your valuable time to spend with the audience today. I know that you've certainly got me thinking and I'm sure you have them thinking, as well. So good luck with your peering into the future and continuing to understand and to look for what's on the horizon. And I thank you very much for joining us today. And to you, the listener, thank you very much for joining us once again for what was a really thought-provoking discussion with John Allsopp today. So thank you very much for giving up some of your time this week and we'll be back at the same time next week, so it's bye for now.