



Plugging the digital skills gap and building for tomorrow: Episode: 4

Asif [00:00:00] Welcome to the Art of the Impossible. A podcast for the design and manufacturing industry that explores how you can leverage technology processes and people to make the impossible possible. I'm Asif Moghal, senior industry manager at Autodesk. And each week I'll be joined by two experts from the design and manufacturing world to discuss their perspectives on the challenges our industry faces and share what they're doing to overcome them. From smart products, mass customisation, digitisation, supply chain resilience and the convergence of once diverse industries. This podcast is for anyone that runs a design and manufacturing business who's interested in making things possible. You can subscribe by following us on Apple, Spotify or via your favourite platform.

Asif [00:00:53] So it's impossible to have any kind of debate about the design and manufacturing industry without the subject of skills coming up. And it's often referred to as a skills gap, but actually, it feels more like a skills conundrum. Because on one hand, we're hearing that skills that were in high demand could suddenly become completely redundant and obsolete. But we still need them right now. On the other hand, we are hearing that the sort of skills that we need to be developing in our industry are really scarce. So how on earth do you strike a balance between closing a skills gap when things aren't particularly clear? So to help us kind of navigate this kind of thorny issue, a really interesting debate. I've got two really special guests, so I'd like to welcome Kadine James, who's the creative tech lead at Hobs 3D, and James Moore, who's the managing director of Hosokawa Micron Limited. So welcome to you both. So I'd like to start by asking you to maybe just introduce your organisation. So, Kadine. Would you like to go first? Tell us a little bit about Hobs 3D. What do you do?

Kadine [00:02:01] Absolutely. I'd be delighted to. And I'm thrilled to be here today on the Autodesk podcast. Thank you so much for inviting me. So I'm the Creative Technology Lead at Hobs 3D. We're a digital additive manufacturing 3D printing buro. We are also an immersive XR, VR and data visualisation studio based at the Olympic Park over in East London. We have studios across the UK and we have also launched a digital skills academy with the Mayor of London looking at ways that we can bridge the digital skills gap and form partnerships and collaboration between industry and academia. And I'd like to talk to you a bit more about that today.

Asif [00:02:54] Great. Thank you. And James, could you tell us a little bit about Hosokawa Micron, please?

James [00:02:58] Yeah, absolutely. Well, first again, Asif, thank you very much for having me on today's podcast. Hosokawa Micron Ltd, we specialise in high containment and particle size reduction technologies. We design, manufacture, deliver and support machinery and systems across a wide range of applications including pharmaceuticals, fine chemicals, food, minerals and nuclear. We differentiate ourselves from our competition as well because we also have a contract manufacturing business as well, whereby we process parties on behalf of customers who may lack the capacity or the capability to operate their own plant. [00:03:31] And we support R&D initiatives in our very own innovation centre, which we opened last year, and we wrap all of that in what we call data driven manufacturing offering as well. [00:03:42] So in terms of processing system optimisation, we call Hosokawa for.

Asif [00:03:48] Thank you. Can't get two better guests to debate this topic. So let's kind of just get into it now. I'd like to start with defining the problem. We keep hearing this term skills gap and there are many views. Some people are saying, yeah, we have a skills gap, it is huge. Some people are saying, no, we don't have a skills gap where we're kind of looking in the wrong place. But in terms of defining the skills problem, what's the problem? What's wrong? James do you want to kick off?

James [00:04:16] Yeah, absolutely. Well, from a personal perspective, I've only worked in manufacturing for four years. I've been with Hosokawa in that time and took over its M.D. in March of this year. And I think I was previously part of the problem, perhaps in terms of perception of manufacturing. So thinking that manufacturing wasn't necessarily the sexiest sector to go into. And I think that has meant that people with a very high skill set may not have been streamed to go into manufacturing or may have looked at it as a bit of a fallback position. But I think that's something that has been prevalent for a number of years. And we can now look to address that and look at upskilling people who are in the sector, but also to attract people with appropriate skills and talent into the sector as well to bridge that gap.

Asif [00:05:04] The gap. We keep hearing the term gap. Using that term suggests that there is a disconnect between what we need and what we're producing in terms of skilled people. So, Kadine, how would you define the gap or the problem from your experience?

Kadine [00:05:22] I think it's a really good question. [00:05:25] And I think that's between automation, AI and all types of bots. There's a lot that can be said about the digital skills gap here in the UK, which is growing. And sure, I think that digital skills gap, in my view and the lack of digital skills in the existing workforce compared to the current and projected demand for growth in technological industries and equally in the manufacturing sector and across industries. I'm also thinking a lot about the availability of key skills in businesses and the threats that will impact their growth and their prospects in a post-covid world. And that's largely due to the lack of technical talent that we have. Thinking a lot about revenue generating innovation in ways that skills really do matter. And it's estimated that here in the UK we have over 10 million or so UK adults that are living with few to no digital skills. So clearly, there's plenty of work to be done. And I think that we need to look at ways that we can start to really embed digital learning from nursery school age right the way through to end of life. [00:06:53] So I'm thinking a lot about digital citizenship. I'm thinking a lot about digital rights. I'm thinking a lot about digital inclusion and ways that we can work together with government, with industries. I'm also thinking a lot about the United Nations Sustainable Development Goals and the digital roadmap on ways that we can shape policies and better outcomes in order to bridge the gap between those that have digital skills and those that don't. [00:07:25] So we launched a digital skills academy because we found that there was a serious lack of digital skills that we needed as an artificial intelligence machine learning, 3D printing, virtual immersive studios, working across architecture, that built environment and the wider creative industries and with, you know, the world's leading engineering companies. [00:07:50] So to address that, we set up a digital skills academy with London Legacy Corporation and have partnered with a number of industry leaders from the construction and the environment sector who sit on our board alongside our digital partners such as Unity, Autodesk and Veeder and Unreal Engine to really look at ways that we could form strategic partnerships, working with our SMEs, working with academics, working with

researchers, and looking at ways that we could connect with the wider community and those that didn't have the digital skills in order to support that and create a talent pipeline that we could then feed into those industries. So we're doing lots of work, particularly within our 3D Skills Academy. [00:08:46] And I'm also really invested in the conversation around how we can create opportunities for 3D tech education from industry-led experience.

Asif [00:08:57] So we're hearing a lot about digital skills. We're obviously training people to become designers and engineers and sort of manufacturing skills through university degrees or apprenticeships. But in terms of digital skills, James, can you give us some examples of some of the digital skills that you think that we need to meet some of the projections that Kadine talked about, but we currently lack.

James [00:09:22] Absolutely. I think we've put a great emphasis within Hosokawa about what we call reverse mentoring. So we have that younger generation of colleagues who are coming fresh from university, fresh from the training, who were upskilling their more time served colleagues, let's say, and finding that bridge so that it's not necessarily one way traffic of the traditional mentoring scheme of the older employees, mentoring the younger generation to bring them through their apprenticeships, bring them through their training development as a happy medium to be struck with that. And as Kadine mentioned a moment ago, something we're finding is becoming hugely important to us is the ability for using augmented reality and virtual reality. So we have the nature of our business, we've got a lot of containment solutions where you have ergonomic testing and sort of physical mock-ups of the building of these glove boxes and these fairly elaborate and multi chamber isolated systems that you can do a lot of the first early stage conceptual design of that as we're finding, remotely. You can use VR and AR or tools to do that. So that in addition to the waste that we have from building wooden mock-ups is also a carbon footprint, elements as a cost. There's a time element from usually significant numbers of our customers would come over to our site in Runcorn and to undertake that ergonomic testing or look at the physical mock-ups, which we then once it was approved or there may have been amended slightly. But you can amend the models in real-time now. So as whereas previously we would have a carpenter on site. Whatever, however long it took, we're doing that. So we're very open minded about how we can use that VR and AR initially for points of difference. But in light of the current situation, it's really giving us a competitive differentiation, competitive advantage, as we're finding now. So we're very much looking at that. I don't think we've necessarily got the killer application yet, but we're always looking at different ways in which we can integrate that into our systems as well.

Asif [00:11:20] That's a really good example. And I've tried to put myself in the mind of some of the cynical people that are listening. They might just say, well, things like AR or VR sound quite advanced in terms of their technology. And in some respects they are. But if we could have looked at a little bit sort of further down the level of complexity in terms of digital skills, are there any other digital skills that are perhaps a little bit more fundamental that you think we're lacking in the industry? So, Kadine, from your experience, what are some of the more basic fundamental digital skills that you think we could all do with more of that we're currently lacking?

Kadine [00:12:00] I think it's a really great question. I love hearing more about the work that James is doing in terms of VR and immersive training. [00:12:08] And we're doing lots of really interesting projects in that space and have been doing some immersive worlds in training future workforces. In hazardous environments using tools such as virtual reality and augmented reality. I think, you know, it's without a doubt that we're in the midst of a fourth industrial revolution. And I think that the boundary lines between different industries are becoming blurred just as our physical, biological and digital worlds are fusing together. I think that the economy, particularly now in a post pandemic world and in general, we are rapidly advancing towards a world of A.I., big data, quantum computing, nanotechnology and the Internet of things, with the billions of devices that are out there and then the metaverse and virtual and augmented reality being a big part of that. And in particular with 5G technology, the implementations of those technologies and how we can ensure that they are human-first is something that I'm very much interested in. I think much of our day to day lives now are now spent online, whether it's from shopping to news, working from home and from how services, digital doctors, and equally thinking about, you know, digital being the new norm. I am also thinking a lot about the UN and the Internet and communication technologies and also thinking about how more than half of the world's population is now online. I think that there's lots of work to be done in order to bridge that gap. And I think that we have to really think about ways that we can explore opportunities and cultivate collaborations from school right the way through to university. [00:14:05] Industry and academic partners to explore these technologies and to ensure that the manufacturing industry are able to adopt these tools in time and ensure that we have workforces that are tech ready because of the rise of automation. [00:14:27] I was having a conversation with somebody yesterday talking about the most popular job in the United States is a truck driver. And I was thinking about driverless vehicles. What will happen to those people if we do get to a stage where we're all using driverless technology? Where will those skills and attributes be needed in order to navigate the world? And I think that having a basic understanding of how to navigate the Internet and how to use digital technologies for digital design across so many different industries and sectors needs to start at school and continue right the way through the later stages of your life. [00:15:16] I'm thinking a lot about digital intelligence and how we can empower children to convert risks into opportunities. I'm also thinking a lot about cyber security. I'm thinking about digital rights. I'm thinking about cyber risks and ways that businesses, you know, can keep informed about how to use these technologies to protect their businesses from cyber attacks. I think those are really huge threats that we face in society today and I'm very much invested in and how we can shape those conversations.

Asif [00:15:46] So great examples from your both. So I heard both of you and James sort of mentioned the word sort of collaboration or you give us sort of a sense of connecting. And it strikes me that that's one of the... Some people think why do I digitise my business? Is it just to do things faster? Which I think is definitely an output of being digital, but being able to connect various different people in more meaningful ways to discuss ideas and topics, I think that that's probably one of the benefits of being digital. And I think what we're maybe touching upon is before you get to the world of A.I. and sort of quantum computing, some of these are quite high level concepts. It feels like there's a level of digital literacy that we could all do with kind of upgrading a kind of level. Would you agree, James, from your point of view?

James [00:16:34] 100%. I think exactly as you laid out there, Asif, we began with putting together a digital roadmap that was originally just focussed on replacing a lot of the paper based manual systems we have with very information rich business. When you start looking at that. So looking at finding some efficiency within that, we then realised in our case we knew the limiting factor was our internal ability. And as you well know, a lot of that journey was Autodesk itself. So we moved beyond that, shifting away from paper based manual systems to eliminating the waste. Bringing some efficiency. But then the next level from now, as we started to add some more richness to our technology roadmap and then we started looking at operational implementation, we realised that our people needed to become more information literate and more technology literate. So one thing fuels into the other. So some fairly quick, easy wins that open your eyes to a lot of the opportunity that comes with that digitisation. And now we find that the scope that we first saw for that digitisation initiative, it's being fed into now by all of our employees. So rather than it being a Top-Down, trickle down project, people are now looking at opportunities, how they can digitise different areas of the business. To be brutally honest, the senior management team, we probably didn't have the scope to see that because we weren't actively involved in those roles day to day. So I think the one thing starting small and then it does gain momentum and you do get that buy in as you go as well. So rather than doing that enormous leap to A.I., it's taking people along the way so that people are actively involved at every step of the journey as well.

Asif [00:18:11] So kind of small, regular steps quite consistently instead of

James very much so, very much.

Kadine [00:18:16] I really echo what James has been alluding to. I think what effects does the lack of key skills have on business performance? [00:18:28] I mean, that was one of the key things that we were thinking about. Particularly referencing [00:18:34] a PwC recent survey, which found that 79% of UK CEOs see the availability of key skills as a top business threat that will impact their growth prospects. So, you know, the skills shortages will cause, you know, a lack of innovation which will raise workforce costs. But they're also more widespread implications, particularly around companies that will be unable to pursue growth opportunities. [00:19:06] Key initiatives and also looking at the quality standards that will slip because of the lack of innovation and the lack of technological advantage in order to compete. So I think one of the things that is also really interesting is who's responsible for tracking the skills gap? With the right skills in short supply CEOs are considering how to source the talent that they need. And we've been drawing directly from the gaming industry and looking at their kind of skills around Unreal engine, Unity and all of the Autodesk software skills, which we obviously use on a day to day basis and have been doing so for many, many years now. So I'm really interested in how we can hire people that have those those skill sets, but also how we can support the existing workforce to upscale because of the need for that knowledge and understanding of digital scales, particularly around additive manufacturing workflows, digital design workflows, virtual reality, immersive worlds and being able to assemble in real time on the factory floor. All of these skills and attributes will be needed across manufacturing and across the world in terms of industries being able to navigate what is a very uncertain time economy wise. But I think digital skills are going to be an essential part of economies growing and the part of the recovery.

Asif [00:20:58] There's absolutely no doubt that digital skills, digital literacy skills, whatever we want to call them, are going to be part of a successful future. And Kadine you just touched on something there that I want to explore a bit further. I see a lot of focus of digital being put on people just coming out of university. So traditionally, design students, mechanical engineering students, basically students who are being taught. And I think there's a lot of focus being put on what should we be adding to their curriculum to help them leave with even higher levels of digital literacy? And I think that's definitely one stream. But one thing that you mentioned is that they're not the only people in the workforce. There is an entire employed workforce of crusty old people like myself who I think we still have some value to offer to the world. So it sounds like that if we're serious about addressing this skills gap, we've got to have a blended approach between the two. With that in mind, James, what on earth, as a managing director just like yourself running an SME type business, what do they need to be thinking about? To kind of at least initiate that blended approach. So let's don't throw away the experience. Let's not just bring in fresh new talent, but let's not ignore the fresh new talent. It's quite a conundrum, isn't it?

James [00:22:29] It really is. Now you're dead, right. We know that a lot of the digital skills are tough to teach. They're continuous. And there will be times when they need to be self directed as well. But we have to give that as leaders within the business. We've got to lead by example. We've got to be role models. We've got to facilitate that for our people. And as you rightly say, particularly in Hosokawa, our demographics are leaning towards the upper end of the optimal scale. How we bring through people, because we know there's a massive amount of value within that group of people. That experience can't be discounted. You're not trading off experience and know how in our sectors for digital skill sets as well. But we know that much of manufacturing in the sectors we're in isn't digital. So we have a blank canvas where in many cases, rather than bringing into the fourth industrial revolution, we still deal with a lot of people in the third industrial revolution stage. So it's bringing that up, but it's doing it at the appropriate pace as well, you see. So we do use a lot of the blended learning approaches and we encourage people to do them. So it's much more practical and experiential as well. So as Kadine mentioned with sort of VR and AR training options as well. So you have a safe environment or not necessarily working in a hazardous environment. But you will use those skills in a hazardous environment later. But it is having that blend. And we have people whose last experience of formal training and education may have been, you know, decades ago in some cases. So we have to make sure we're getting the right blend and the right structure within those training programmes. So there'll be some that will be in person. Obviously, now, much of it is or all of it has moved online. But it is learning those structures, so that they can embed it, they can take it back into the workplace and embed it. But can also be assessed on how effectively they're bringing back into the workplace. And that reverse mentoring scheme helps a lot, we find, because there may be people who may be slightly apprehensive of applying the digital skills. So it may be being encouraged in some of the learning aspects and between improving critical thinking or your creativity. But you mentioned a key word at the outset, Asif, about collaboration. So there are all these traditionally softer skills that we know will complement the knowhow in terms of powder processing or containment expertise that we have within Hosokawa.

Asif [00:24:52] I can imagine that having that conversation with people of – I'm going to put myself in the spotlight – of my demographic age, you know, being faced with the challenge of digitising how I've always done something. Let's say I've been to university and I've studied an engineering degree and I've worked for a number of years doing a specific kind of

role, you know, in a traditional manufacturer. It's quite a daunting prospect. If somebody came to me and said Asif, you need to be more digital. I can imagine that a lot of people might be quite reluctant or might have a sense of anxiety or attention around that. So Kadine, from your experience, do you think people are willing to kind of upscale, retrain, add to their skill set? Is it an easy conversation to have? Are you having it with a receptive audience?

Kadine [00:25:39] This is a really, really good point. [00:25:41] And I was on a call earlier on this morning with Make UK, who head up the kind of consortium for the UK manufacturers up and down the country, speaking with their head of policy today. And on exactly that. And in terms of the SMEs and the adoption of digital technologies. But I think, the fact of the matter is if those organisations don't get onboard, then they're just going to be left behind. And I think that we've identified that there is a significant issue in terms of retraining and upskilling. And I think that it's really important that we work together, we form collaborations. We make sure that we have robust policies, the support from government, support from the digital innovation world in terms of being able to establish ways that we can support and collaborate to close the digital skills gap and really look at ways that we can harness opportunities for collaboration to support SMEs. And looking at ways that we can establish a strong pipeline directly from education, but also from those that are being left behind. In particular, we've been working with our Skills Academy from poor parts of London or from areas where they may not have had access to a college education or be in work. We're really interested in ways that we can support those individuals, too. So I think it's about developing collaborations, support from government, funding and ensuring that we can all work together to look at ways that we can address the digital skills gap, which we know is widening. [00:27:43] I also think that there's some really interesting research that's happening, particularly around the racial digital big tech gap and how we might be able to close that window. And I think that minorities, particularly from black and Hispanic groups in the States and also here in the UK, the statistics are stating that they're 10 years behind in terms of access to broadband, in terms of access to connectivity. And these are things that we really need to own up to and address to ensure that we have a fairer society and that we can create opportunities so that people don't get left behind and are not digitally excluded. And we can create a world which is fairer because that is very apparent to me with everything that's happening, particularly with Black Lives Matter, with the big tech companies not being held accountable and paying their taxes. [00:28:54] There's a whole other conversation that I feel I'm very interested in and looking at ways that we can really make a fairer and more inclusive society.

Asif [00:29:07] And I think it's pretty well documented that the more diversity you seem to, I mean, I just think any aspect of professional lives and personal lives. I think the better the outputs, the results, whether that result is like your level of happiness or quality and productivity, creativity and innovation.

Kadine [00:29:26] Absolutely. And I just have one other point I wanted to make. [00:29:30] I really want to use the platform that I have as a woman working in technology to support those from underrepresented groups. And I'm doing lots of work in that space. And I think that the world is clearly shifting from analogue to digital faster than ever before, which is

exposing us to lots of promise and opportunities. But also it's bringing about a number of challenges in terms of the growing digital divide to cyber threats and human rights violations online. And I think that as a society, we need to come together in order to address that. And that's going to take a multidisciplinary, interdisciplinary approach from across sectors in order to form collaborations and a collective intelligence that will help us to address that.

Asif [00:30:26] So what I'm hearing so far from this really fascinating conversation, in terms of skills, it does seem like there's a disconnect in terms of where we know we need to be as an industry or a society, the availability of the people that have those skills to kind of get us there. It seems to be that it's not just about what we teach engineers and designers in university. It's a lot broader than that. I've heard you both talk about this, some hard skills you need to learn. Traditional mechanical engineering is one example of that. But there are some of the softer skills. James you talked about the ability to collaborate. And having a level of digital literacy to almost... How do you use technology not just for the sake of technology? But how do you use technology to deliver your hard and soft skills? And I think that I think you've got to try and define digital literacy, probably that's what it is. How confident, comfortable are we to use tech to deliver our expertise, hard skills, soft skills to get our job done, whether that job be designing a new product to a bridge or a railway, or solving big challenges like sustainability and climate change challenges.

James [00:31:40] It becomes very important that point Asif, because we find that the people in whatever context are running the business, there's a much greater on us, on them, to coach and to lead people through that transition as well. Because there is a genuine fear of potential obsolescence with some people who would just put up the barriers against the march of digital progress. But as I said there's a much softer skills from the management in the business as well to make sure they're giving the appropriate coaching to make sure they're leading them through the change at the right pace as well. So there isn't pushback on them.

Asif [00:32:15] So, again, management's skills, which is quite interesting because it's a subject of another podcast that we've been recording about leadership and things. So one of the things that I hear a lot whenever we go in and talk to a manufacturing company about digital it's a fear, whether it's founded or not we don't know, but we don't think so. I'll summarise it in terms of the robots, the A.I. is going to take my job. And I think that seems to hold a lot of people back. And some people's reaction is to step forward and embrace it and say, OK, you know what? I'm going to look for different, better things to do. There are people with that sort of mindset. The sorts of people with the mindset of, oh, my God, I'm just going to try and keep working harder at my job. Do what I do harder, and perhaps the robots will ignore me. So Kadine, from your point of view, what evidence is there that intelligent automation like this will destroy jobs irreplaceably? Or is that a myth? Does it just create opportunities for new jobs? What's your experience been?

Kadine [00:33:25] Yeah, I think that's a really great question. And I think that I like to respond to this question with a sense of hope that the robots are not going to be taking our jobs, but they're going to support us to do our jobs. [00:33:43] So human first technology and making sure that future workforces and current workforces have a support from leadership, from business and from government and from, you know, better policies in order to ensure that people don't get left behind and that we can create better jobs for the workforce and use the technology to support us to do our jobs better. [00:34:20] That's something that I think a lot about. [00:34:25] And I'm interested in ways that we can enhance the technology in order

to support society and to support the future workforces. I'm thinking about the Industrial Revolution back in 1784. I'm thinking about primary skills, physical skills, thinking about practical skills, cognitive skills, and indeed, digital skills due to the digital revolution that has taken place, and ways that society's going to need to be adaptable to what's coming.

[00:35:08] There's no pressing pause now on the technology button. [00:35:14] And I think that, you know, businesses need to make sure that they're looking at ways that they can upscale their current workforces. And I think we also need to be supporting schools.

[00:35:28] We do a lot of work with primary schools, a lot of work with education, thinking about building the skills and attributes needed for the future workforce. What are those skills? What do those skills look like? [00:35:44] I think creativity, commitment to wanting to learn and know as much as possible about all subjects, and being adaptable. [00:35:54] I think that those are the skills of attributes that will be needed. And having a creative mind that is open to exploring these opportunities that will be presented due to the rise of technology.

Asif [00:36:10] There's definitely a sense of, maybe I'm not expressing this correctly, but the days of the super specialist who spend several years at university to learn this bit of a manufacturing or design, that's changing to the specialist generalist, someone who's good at going finding out an answer, then applying that solution and then moving on to the next thing. I feel a real strong sense of that. So if that's true, let's say it's a bunch of managing directors walk in the room, or virtually join us right now, and they say, okay, I've been listening to you guys talk and I want to do something that I can just do on my own to start upskilling my own business and my workforce. So, James, where would you start? What could other leaders of SME, SMB manufacturers do? That doesn't require anyone else's help. Doesn't require policy or that kind of stuff. What can they practically do to get dialling up their digital literacy inside their business?

James [00:37:21] It's a very good question. I think in the first instance for us, it was as it would apply to anyone, identify where you can start building wins, because that builds momentum into that digital transformation digitisation in general. Whether you've got the capability to draw the technology roadmap yourself or you to get support from people who can help you to do that, I'd suggest. There's a say for us that was a huge accelerator in the process and to be introduced to people who in some cases already done an assessment of available technologies and could give us a bit of a stare on what would best fit or most appropriate for our stage of maturity on this in this process. I think internally as well. Look at your people to commit to a skills audit to see what you've got in-house. We've got a couple of guys internally and through the process of lockdown where we've just resorted or reverted to MS Teams for most of our interaction. There are so many tools embedded within that which we had no idea about. So we're using that to do these poll surveys to check on people's well-being, to check on their enthusiasm and their concerns as well. So going into the softer side of things, but using the technology to do that, which helps it become more embedded into what we do. But in terms of your people as well, I think it's really important, as you said, to look for a specialist generalist. But the importance of people who are adaptable and able and willing to enact change is really important. So this person you may recruit in the first instance, they may be a square peg, but over time they may fit into the round hole because there's a willingness to engage in the technology as well. But it is: look at what's out. I'd say speak to your peer groups as well. I think conversations like this are really interesting. I've been jotting down a few notes on VR/AR stuff as well, because whatever path you're on, you're not necessarily going to know it all yourself as well. So it is about collaborating both internally and externally, I'd say.

Asif [00:39:22] Kadine, what do you think if more managing directors started doing the sort of things that James was talking about, what are the policymakers need to put in place to enable that to happen? Any any kind of thoughts on advice you'd give to our current government, future governments, governments and other countries?

Kadine [00:39:41] I think funding is going to be central to really supporting the business community with the covid pandemic and many people being furloughed and those industries where many, many people are going to be impacted. What kind of ways will we be able to support that? What policies and procedures can we put into place in order to upscale those individuals and create opportunities for new jobs, better jobs, well-paid jobs? I think those are the things that we need the government to be seriously thinking about and forming collaborations and partnerships with industry, with academia in order to address that. One of the key things that we've done, Hobs 3D, was thinking about how we could make technology accessible. [00:40:36] So we identified, as I alluded to earlier, a significant gap between education in 3D tech and experience within the industry itself. And we were really thinking about people from all backgrounds being given an opportunity to gain skills and experience within the 3D industry in order to progress for their future. [00:40:58] So we set up our 3D Skills Academy with the mayor of London. We've established a state of the art training programme for individuals from underrepresented backgrounds from across London. [00:41:12] Our curriculum covers 3D printing, data, visualisation, digital visualisation, as well as architectural and product model making. So we focus on exploring the future of these technologies and we run a number of tutorials which have gone online due to the current pandemic. But that also created an opportunity for us to bring together individuals and collaborations from all over the world, which was beneficial. And then also thinking about industry placements and the personal learning times. So, learning from industry leaders like myself and learning from the people that work within our teams, creative technologists and real artists, industrial designers, digital product designers. We've run a 3D printing module which covers all of the mainstream 3D printed technologies. Looking at the Autodesk products, participants explore how the industry is consistently adapting and growing in response to these technological advances and how 3D printing is being used across architecture, built environment, construction, the creative industries and also learning about, you know, typical workflows of 3D printing from modelling and looking at geometric primitives, mould making and design for 3D printing. Digital visualisation as well. We're also giving an insight into how these technologies are rapidly advancing, particularly the use of virtual reality, which James and I are both working in and around at the moment. Augmented reality and thinking about developing skills around data preparation, environment, building textures, lighting and setting up interactive 360 environments due to the 360 technology being used in training future workforces. So we set up a number of scenarios in gaming environments that are being used to develop skills with our current cohort of participants. So those are the practical things that we've done from an industry perspective, looking at ways that we can form meaningful partnerships with businesses that we work with so that we could create apprenticeship pathways into industry. Those are the things that I think are going to be incredibly important. And I think the government needs to invest and look at ways that we can bridge this gap before it widens even more.



Asif [00:43:53] There we have it. Skills, skills don't seem to be just limited to engineering, design and manufacturing. [00:44:00] The hard traditional skills that we historically have been training people in and sort of working in, digital skills seem to be applicable to every aspect of our business and our life. And we seem to have a disconnect between where we need to be and the availability of people who kind of understand that big picture and are able to have the confidence to apply digital skills to deliver their hard expertise, knowledge and sort of soft skills. Design thinking, critical thinking. Just being creative and being comfortable using technology to do that. It sounds like if we wanted every managing director of an SME/SMB business to take a step, it would be to do what James is suggesting: is kind of look at your people, look at the sort of skills that you might need and kind of just try and find a way to continually make them feel comfortable with the technology. Maybe in a kind of [00:45:02] software, in terms of your virtual coffee meetings, or things that get them to cut their teeth on collaborative tools. And maybe their confidence might grow. And that sounds like a really realistic and achievable thing to do. And then behind that, it sounds like what we're saying is that if we could create an environment of funding and support from the policymakers in the government, that might accelerate our closure of the skills gap. So I really hope that as you've been listening to this podcast, there's been some nuggets of information that you can take into your practical work. And I'd like to thank both Kadine and James for joining us on this podcast today. And we look forward to speaking to you on the next episode. So thank you very much.