SDS PODCAST EPISODE 777: GENERATIVE AI IN PRACTICE, WITH BERNARD MARR

Jon Krohn: 00:00:00 This is episode number 777 with Bernard Marr, futurist and many-time best-selling author. Today's episode is brought to you by Intel and HPE Ezmeral Software.

00:00:14 Welcome to the Super Data Science Podcast, the most listened-to podcast in the data science industry. Each week we bring you inspiring people and ideas to help you build a successful career in data science. I'm your host, Jon Krohn. Thanks for joining me today. And now, let's make the complex simple.

00:00:45 Welcome back to the Super Data Science Podcast. Today's guest, Bernard Marr is about as big as they come. In case he isn't already on your radar, Bernard is a world-leading futurist who's consulted with NVIDIA, Google, Microsoft, Amazon, and many more on digital transformation and AI in business. His 20-plus books, 20 plus have been translated into 20-plus languages and earned several business and management book of the year awards. Many have also been bestsellers. His writing has been featured in the Guardian, Financial Times, Wall Street Journal, Harvard Business Review, and many other leading media outlets. He has over four million combined social media followers. Bernard's latest book is Generative AI in Practice: 100+ Amazing Ways GenAI is Changing Business and Society. It was published by Wiley just a few weeks ago. To mark this event, I will personally ship 10 physical copies of Generative AI in practice to people who comment or reshare the LinkedIn posts that I publish about Bernard's episode from my personal LinkedIn account today.

00:01:49 Simply mention in your comment or reshare that you'd like the book. I'll hold a draw to select the 10 book winners next week. You have until Sunday, April 28th to get involved in this book contest. Today's episode will be of interest to anyone who'd like to better understand Generative AI and how to adopt GenAI effectively at work

or at home. In this episode, Bernard details the history of GenAI. How GenAI will pair with other industries like energy, healthcare, and education to accelerate hyper-innovation across every aspect of society. The regulatory and ethical challenges associated with GenAI and how we can overcome them. How AI paradoxically makes us more human, and how to successfully implement GenAI both professionally and personally. All right, you ready for this excellent episode? Let's go.

00:02:38 Bernard Marr, welcome to the Super Data Science podcast. It's unreal to have you here. You're one of those guests that when the opportunity comes up to have someone like you on the show, I am pinching myself. I can't even believe it that I get to have a conversation with you. Where in the world Bernard are you calling in from today?

Bernard Marr: 00:02:54 I am in Milton Keynes, just north of London in England.

Jon Krohn: 00:02:59 Nice. Yeah, we were connected because you have a book coming out, and someone reached out and said, "Bernard has this book coming out. It's about generative AI. Would you like to have it on your show?" Our regular listeners know that we're constantly talking about generative AI, but this episode is a little bit different from what we usually are covering on the show because often we're in the weeds on large language models and open source libraries for training and deploying LLMs. Today's episode actually should appeal to just about anyone who's interested in generative AI and how they can be making the most of it in their lives, including their business place. You're the bestselling author of over 20 books. This latest book is called Generative AI in Practice: 100+ Amazing Ways Generative AI is Changing Business and Society. In it, you've boldly stated that generative AI represents the most powerful technology humans have created. In your view, Bernard, what makes it deserving?

What makes generative AI deserving of this distinction compared to past innovations and how profoundly could it change people's everyday lives in the next decade?

Bernard Marr: 00:04:06 Yeah, very good. First of all, thank you so much for having me. I'm really looking forward to this conversation. I believe generative AI will transform every industry, every business and every job in the world, and I don't think we've had technologies that have had this massive impact. We've had other technologies like steam and electricity and computers that have triggered these industrial revolutions. What I am now seeing is that we have a number of different technologies that could all probably individually trigger some sort of industrial revolution. If we spoke a year and a half ago, we would be talking about the metaverse. I don't really like the term, I like extended reality or more immersive worlds, and I believe that generative AI will impact some of these other transformative technologies like the immersive technology. For me, a really good example is when we talked about the metaverse, people said, "Okay, I want an online store that people can explore in VR." But I needed a game developer, a game designer to design this for me. That was expensive.

00:05:23 Now I can simply put a prompt into an AI tool to create any type of design I want. I can jointly develop this until I'm super happy with it. It will enable other technologies. Then we have technologies like quantum computing that will accelerate AI. We have technology like blockchain that will have a fundamental impact on how we use AI and data in the future potentially. We have other really huge advances in nanotechnology and gene editing and around science and healthcare that AI will accelerate massively. I believe that this is creating this new world of hyper-innovation where generative AI sits in the eye of the storm and it will be influenced by other technologies and

it will influence other technologies. This is why I believe it is so fundamental.

Jon Krohn: 00:06:24 That's a great answer, that idea of hyper-innovation makes so much sense to me across so many industries. One in particular that I get really excited about is in energy. Things like fusion energy, which has been the energy source of the future that's supposed to be coming in two decades, and we've been saying that since the '50s or something. But now it does seem like we are potentially really on the precipice of it with AI playing a key role in things like keeping the plasma contained. A lot of the fusion approaches involve tokamak reactors and AI can be critical in keeping the plasma from touching the walls in this reactor and allowing us to have real commercial fusion in potentially the near future. When I think about hyper-innovation, that's going to be facilitated by this intelligence that you've just been talking about. Plus, if we have abundant energy, things could be really crazy.

Bernard Marr: 00:07:22 Yeah, I agree. I also believe that we need this powerful technology in order to solve some of the world's biggest problems. For me, energy is one of the biggest problems. We have huge challenges around climate change, and if we can solve that, that will be a massive boost for everything on the planet. We also have so many other huge challenges in the world like inequality to healthcare, inequality to education, and all of these sectors could be potentially transformed and in so many ways, generative AI can democratize and make access universally accessible to these. I'm super excited about all of this. Even before we get to fusion, we can use AI to help us improve the data usage in our data centers. Google has done this very successfully where they reduced the energy used by 30%.

	00:08:22	If we now look at, "Okay, how can we replicate this for the entire energy grid in the US and around the world." That would be amazing if we can save 30% of energy, and how can we use it to make better batteries. Maybe using fewer rare earth materials and other things. I have a real hope that this technology will give us humans this super power to solve some of the biggest problems we are facing.
Jon Krohn:	00:08:50	For sure. And some of those innovations that you mentioned there around healthcare inequality and education inequality, one of the nice things about those is those can be tackled with GenAI without necessarily us needing that much more energy. Those kinds of innovations, that kind of equality could potentially be delivered on a handheld phone device, and it might not be very long before we have large language models working on the edge in phones or other small devices and allowing people to learn whatever they want, like get answers to medical questions that represent the best expertise better than you could get from any individual teacher or any individual physician. I'm really glad that you brought those up as well.
Bernard Marr:	00:09:34	Yeah, that is a great, great point for me, this ubiquitous connectivity and ubiquitous computing as I call. It's another huge trend that impacts obviously AI. With 5G, we can untether AI from our Wi-Fi networks. With edge computing, we can bring it to our smartphones, and that is super exciting. Because, again, it optimizes the use, we don't have to send everything back to the cloud and to a data center, and we can leverage the increasing power that we have on our devices and in our glasses and whatever we might be using in the future to access the digital world.
Jon Krohn:	00:10:12	Nice. We just gave some great insights into how GenAI could transform industries over the coming decade. In chapter two of your book, you talk about the pivotal

moments that propelled generative AI from theoretical concepts to practical reality today since the 1950s. Would you like to give us a quick overview of that evolution?

Bernard Marr: 00:10:33 Yes, sometimes when I give talks about AI to a business audience, they think this is all two years old because they've started to hear about ChatGPT. I think it's really important to understand that this is a 50-year-old technology that has evolved. And for me, some of the key moments were obviously the amount of data we have available in the world because 50 years ago people had thought actually we can use data to train AIs or we can use our intelligence to train and teach AIs, and now these two are merging together. We had neural networks that started to learn by themselves from data. For me, what is really exciting is I've recently seen how robots can now learn and do things. They can use things like reinforcement learning and neural networks to learn by themselves, to run, to play football, to pick things up.

00:11:35 What I find super exciting is if we then combine this with a little bit of supervised learning where human can say, "Hey, robot, how about you do this and this and this, learn from me." And then we feed this back into the AI that was just learning from its own data and its own experience and seeing how this would accelerate the learning process and how quickly it was able to do things it could never do before. For me, these are all pivotal moments, machine learning, reinforcement learning. Big milestones for me obviously, is when Deep Blue beat Garry Kasparov at chess. That was a perfect example of traditional AI where we could just use brute force computing power. We could explain exactly how chess work and the AI would then simply compute more possibilities faster than humans can. Then for me, another big milestone was when Google DeepMind beat Lee Sedol at Go because Go is so complex that we simply

haven't got enough computing power in the world to calculate all possible moves.

00:12:45 We needed to do something differently. Instead of just teaching it, all the possible games have been played by humans. It then learned by itself playing itself. During the game, it came up with very creative moves that humans had never seen before where people initially thought, "Okay, maybe machines are not quite as advanced." It became very clear that they are probably more advanced in certain ways. That was, for me, a pivotal milestone. Then obviously the large transformer models that we are seeing today, especially how fast they're developing new capabilities and becoming multimodal. I still have this when I talk to people that are not really into AI that much about, "Okay, let's talk about large language models and ChatGPT type of tools." They think it's a chatbot and that it can now produce music. It can create images, entire worlds that it can create synthetic data. It can analyze data in an amazingly context specific way. All of these things for me, we need to understand that these are breakthroughs that are coming so fast today and they're something we've not seen before.

Jon Krohn: 00:14:09 Ready to master some of the most powerful machine learning tools used in business and in industry? Kirill and Hadelin, who have taught millions of students worldwide bring you their newest course, Machine Learning Level 2. Packed with over six hours of content and hands-on exercises, this course will transform you into an expert in the ultra-popular gradient boosting models, XGBoost, LightGBM, and CatBoost. Tackle real-world challenges and gain expertise in ensemble methods, decision trees, and advanced techniques for solving complex regression and classification problems. Available exclusively at superdatascience.com. This course is your key to advancing your machine learning career. Enroll

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00:14:52 Great summary there of the history for sure, and for me as well, AlphaGo was a huge moment. I think that happened decades more quickly than people were anticipating, and now we're seeing that regularly. We're seeing on a yearly basis innovations that we thought were decades out happening very suddenly, thanks to scaling up the transformer architectures that you were just mentioning. For example, for me personally, a year ago when GPT-4 came out, that was a crazy moment for me because if somebody had said to me just six months earlier... In autumn of 2022, if somebody had said to me in our lifetime, "Do you think we could have an algorithm that could do all of these things?" And you listed out GPT-4s capabilities, I would've said, "That sounds really hard, and I don't know if we can do that in our lifetime." Then six months later, we had it.

Bernard Marr: 00:15:44 Yeah, I agree. Sometimes people talk about how overhyped this whole field of generative AI is, and I agree that there's lots of hype there. There's organizations pretending to use AI when they're not, and suddenly everything has become AI. Just one example, I was watching TV last night and there's this vacuum cleaner that is now AI powered, and you think, "Hey, that is taking it a bit too far." Because this is not a robotic self-driving vacuum cleaner. This is just a normal one that you push along. How much AI really is in there? But I think on many levels, as you said, even as someone that my job is to look into the future and help companies to prepare for this, even I'm surprised and amazed on a daily basis about how fast some of these capabilities are developing.

Jon Krohn: 00:16:36 For sure. We'll talk about Sora later in the episode. I've got some questions for you on that, but that's, I think, the

latest thing's completely exceeded expectations. Speaking more on this theme of futurism that you do that you just mentioned, how will generative AI impact daily life, not only at work but also at home? Do you have some specific interesting examples that might blow people's minds?

Bernard Marr: 00:17:01 Again, every aspect of our life would be affected. For me, a perfect example is how we search the internet. Traditionally, we would put a search term into Google and then get served lots of possible websites that might contain answers, and then we have to click through the different websites to find answers. My kids that are between 12 and 18 years old, they simply use GenAI. They use ChatGPT or the GPT-4 version that is now part of Snapchat. I'm sure you've talked about this on the show, that Snapchat added an AI friend to everyone's Snapchat friend list, and this is this amazingly powerful friend that knows everything and can answer your questions. That means kids, if they want help with their homework. They can simply ask the AI, they don't have to Google about how do I solve this formula? They take a Snapchat of it on their camera phone and say, "Hey, this is my homework. Can you explain this to a 12-year-old how I solve this?"

00:18:17 Or another really good example is taking a photograph of the content of your fridge and saying, "Hey, can you suggest some recipes for me?" Again, you can take it to completely new levels. If you are gluten intolerant, you can just say it, "Hey, I don't want to use this. I want to make sure there's no gluten in it. I want to have those health benefits." For me, AI will become this genie that sits on your shoulder that will help you to do every everyday task better than you could previously do.

Jon Krohn: 00:18:52 Yeah, exactly. Great examples there. Are there ethical dilemmas? I know that you know there are. Chapter four is all about them. How can societies navigate the ethical

dilemmas that generative AI presents, especially in things like ensuring truthful representation and protecting individual privacy?

Bernard Marr: 00:19:11 Yeah, there are huge ethical challenges, and I think one of the really important takeaways from the book is that organizations need to approach AI responsibly and ethically and in accordance with law. But going beyond this, because regulators tend to lag behind massively on all of this. There are challenges around some technical issues like hallucinations. AI making stuff up every now and then. When I use generative AI, for example, if a conference producer asks me, "Hey, can you give me a 50-word bio of yourself?" Then another one says 100 word summary and another one wants a 200 word summary, I use AI. I say, "Just write me a 50-word summary and 99% of the times it writes a perfect summary of my biography. Every now and then it comes up with something completely random that I've got degrees and doctorates from places I've never even heard of.

00:20:15 And you think this is so crazy. But I think some of those technical challenges we will be able to address because for me running two of these large language models in parallel, but one sense checks the other, we can almost eliminate that. That is super interesting for me. Then we have a huge challenge around the data and bias. Obviously these models are based on data, and data unfortunately has huge biases in them and will always have. But for me, this is also an opportunity that we can actually use these to counteract this. If you use the very first versions of ChatGPT and say, "Hey, give me a list of jobs that women would do." It would come out with housewife and secretary. If you do the same today, this list looks extremely different and it's much more representative of our world today. Google Gemini, for me, is a perfect example where they recently caught up where

their image generation tool created images of Vikings that were Black and Native American.

00:21:22 And you think now they've almost gone too far with creating this unbiased system that is now creating historically incorrect images. We still need to get this right. There are challenges. I think important is to still have a human in the loop somewhere. Some of these technical problems and bias problems, I think, we are working on and we are solving. A much bigger problem is how we use it ethically in terms of what we are producing with it and the impact this will have on society. For example, we have AI systems that are absolutely capable of producing amazing music. I could say, "Hey." Whatever AI tool this might be, "Give me a song that sounds like Sia. That is pop rock from the 2000s." And it will create this for me, and the song will sound like Sia has sung the song. Can we release this?

00:22:32 No, because it has huge implications in terms of copyright issues, in terms of how do we value this? For me, this is an super interesting dilemma that we are facing at the moment, that these tools are super powerful. But actually, we can't quite release them yet because we haven't solved some of the issues around ownership, around copyrights. I'm just observing the space with interest and see where this is all going. In my book, I have a whole chapter on music and entertainment. And there are some examples where artists are happy to say, "I'm super happy to license my voice to this AI and let people use my voice. I will be honored for them to do this, and they can create new music with it."

00:23:27 Others say, "No, I absolutely don't want to do this." And where the pendulum will swing and what's right or wrong will be super interesting to watch. In the same way where we see content generators like the New York Times doing OpenAI and Microsoft because their content might have

been used to train their AIs. Where will this go in the future? Will everything we use to train AIs will have to be licensed somehow? We don't know where this is going, but it's super interesting. We need to watch out for the impact and the legality of some of these.

Jon Krohn: 00:24:05 Yeah, I think the most interesting example or the most prominent example of someone in entertainment being okay with their voice, their persona being used to make music as long as they get royalties is Grimes who-

Bernard Marr: 00:24:20 Exactly.

Jon Krohn: 00:24:21 ... has a child with Elon Musk. I guess maybe not so surprising that she's tech forward. Yeah, you mentioned in there the idea of having a human in the loop still being essential today. In chapter five, you talk about powerful ways that organizations can harness GenAI that highlight the potential for human collaboration with AI as opposed to replacement. Do you want to talk about that at all?

Bernard Marr: 00:24:49 Yeah, I get this question asked all the time. What will this mean for jobs in the future? I think there's a lot... I have three children. I've got three children between the age of ages of 12 and 18, and I worry about what that might mean for them in the future. My hope is that AI will not replace us, but augment us. What I'm also hoping for us that AI will make us more human instead of less human. Sometimes we position AI as men versus machine, and I completely understand why, because it sells newspaper and papers and magazines and people click on articles that say, "Okay, AI is coming for your job." But my hope is, in practice, that will augment our jobs. I have actually written an entire book on future skills because I get this question asked all the time. What skills will we need? How do we compete with machines in the future?

00:25:57 And out of 20 skills I talk about in the book, three are technical skills. I need to have some technical understanding and understand the capabilities of all of these technologies we've touched on. I need to have some data literacy to some extent. I need to understand some cyber threats that are coming along. Beyond that, rest of the skills are the ones that make us truly human. They are our creative problem solving. They are our interpersonal communication. Our complex decision-making. Our ability to understand whether data is true or not. Contextualizing things. All of this stuff that really makes us human. My hope is that we will outsource some of the things that, in my opinion, we waste our immense human potential on doing. Just a tiny little example. Whenever I write a Forbes article, Forbes ask me to basically capitalize every word in every sub headline.

00:27:07 And this is very often not how I write. I just write and then I need to go back into the article and make sure that every word is capitalized. I can now give this to ChatGPT and say, "Hey, please just capitalize this." Takes a second and is done. This is for me such a... It was a waste of my capabilities because now I can spend more time being creative thinking about how do I want to tell my stories? My hope is that we would just get more of this. A perfect example is radiologists. If you are a radiologist in a hospital that analyzes X-ray images or CT scans, AI can now do this very well. I remember I took my son to the hospital recently, and we suspect that he broke a bone in his hand and the doctor came back and said, "Okay, we can see there's a hairline fracture in the middle of your hand, but the AI's also suggesting that you might've broken your finger as well."

00:28:13 She was saying, "We can't actually see this with our eyes, but the AI usually is right." The AI now is able to do this. For me, we come to biases and we talked about biases. Humans also have huge biases. If you are radiologists

and someone has come in for a potentially broken back and they've been through a CT scan, our bias is that we will only look at the broken bone and look at have they potentially broken their back? But because the CT scans scans the entire body, there might be secondary or tertiary diagnosis that might be relevant as well that we as humans would never look for. The AI can do this. We are now at a stage where the AI can analyze images and CT scans much more consistently and probably at the same level, if not better than humans can.

00:29:15 What does this mean for radiologists? It will change the way they work, because if you think about this, is it really the best use of this amazing human potential that we have where someone sits in a dark room for eight hours a day trying to understand is this bone broken or not? Or would it be better if we spent more time on maybe talking with a patient about what this all means? On doing research to further the field of radiology and make it better. All this exciting stuff.

00:29:47 My hope is that this is what AI will do. In the short term, I have some concerns about how ready we are as a world to move to that, because there are so many people happily or very often not happily working in jobs where they earn a living doing stuff that actually is a waste of their potential, but it's a necessity to earn a living. This transition will be difficult, and I think it's really important for governments and for businesses to understand that we are seeing this huge transformation and it means we need to retrain people. We need to augment their jobs, and we need to help them in making this happen.

Jon Krohn: 00:30:33 The hybrid cloud promises freedom, but for AI and analytics, it can feel like juggling chainsaws. Data silos hold you back, toolsets clash, and managing resources across environments becomes a nightmare. This is where HPE Ezmeral Software steps in. On May 2nd, join a free

webinar powered by Intel Xeon Scalable processors and HP Enterprise designed for data science professionals facing these hybrid cloud AI challenges. You'll learn how to empower AI model building and training with seamless access to global data sets, leverage built-in connectors in a curated open-source ecosystem to focus on innovation and trade in Frankenstein infrastructure for consistent environments that simplify resource management and accelerate any AI journey. See the show notes for the link to this free webinar on May 2nd.

00:31:17 Yeah, exactly. That's something that I often say in the talks that I give in terms of what we can be doing today to ensure that this AI transition is positive, is talking to your local elected representative to encourage them to be funding retraining programs because some people are going to be left in the lurch by these changes, and we want them to be happy too. We want these innovations to benefit everyone, not just the people who jumped on top of them first. Those radiology examples you gave their first-hand are really cool. I wasn't aware of that. I guess that's just part of the NHS in some hospitals now. They've rolled out AI for radiology. To me, that sounds, it's the kind of thing that I would expect on the show. It's like, "Hey, this is coming." And now it's already here.

Bernard Marr: 00:32:07 Yeah no. If you now buy a CT scanner from any of the big companies like GE or Siemens, it literally comes with the capability to analyze the data.

Jon Krohn: 00:32:19 Cool. Let's talk about some more industries that will be impacted by generative AI. You do a great job in your book. Part two is focused on chapter by chapter, different industries that are impacted. We already talked about entertainment a bit and how human creativity can be augmented with AI. Do you think that there is some intangible quality of human creativity that machines might never be able to replicate? Or do you think that

eventually it will be difficult to distinguish between AI-generated music or art and human-generated?

Bernard Marr: 00:32:59 It's a very philosophical question. It's a question I've thought about many times, and to be honest I can't see why machines wouldn't be able to replicate many of the things that we do. Because for me, creativity very often is bringing together two complete disconnected things and come up with new things. Creativity, to some extent is really understanding emotions that we might have and turning them into songs, into books, into new ideas. I can't see any reason why machines couldn't do this because we already have machines that are emotionally intelligent, and you think what really is emotional intelligence is our ability to pick up signals in people's voices, in their facial expressions, in their body language, and we can train machines to do this very well. I am not sure, is the answer. But I don't think so.

Jon Krohn: 00:34:15 I think your intuition is right. I've had the same opinion that eventually machines will be able to be as capable on artistic endeavors. I think something that's interesting is that often what makes great artists famous and their works famous is often interesting stories about themselves or the work. For example, the Mona Lisa only became famous after it was stolen and recovered, and now we revere it as one of the world's most amazing paintings. But it stands out because of this historical story. Same thing, Van Gogh and the psychological traumas that he endured and the way that shows up in his art is a big part of probably why it's so valuable. Even if machines are able to create art that surpasses human ability, I wonder if the interest in it will be as big as if there's a human story behind it.

Bernard Marr: 00:35:20 Yeah, I completely agree. And I don't think if we use an AI to create a great painting or even a robot to paint it, that humans will connect it because we need the human

emotions, the stories that come with it to connect to something. But I believe that working together within AI, it can elevate human capabilities to be even more creative and express themselves in different ways. We talked about the fact that AI can now completely create music by itself. Whether this is valuable, there might be a case for it. If you are in the gym and your watch detects that you are running at a certain step count, the AI can generate music that is in tune with this, that you don't need to emotionally necessarily connect to this song. I found it super cool to watch Mercedes-Benz at this year's CES for example, they collaborated with a few artists who used generative AI for the car to basically create a soundtrack to your driving automatically.

00:36:42 It would use cameras in the car, outside the car to see where are you, how are you driving, what's your emotional state, and it would then create a soundtrack to you. There's a room for AI-generated music. Will this ever be a chart topper that we all emotionally connect to? Possibly not. But it democratizes music-making. Someone might have this amazing ability to write a song or has an amazing voice but can't play instruments. That person can now use AI to help them create a song and even release a song. My hope is that it will again enable this core creativity between human and machine that will enable us to be more creative.

00:37:35 While I was talking, I was thinking about your previous question. I think that when it comes to creativity, even though I think AI can replicate creativity, what it won't be able to do, what humans, I believe, are able to do is to imagine a better future and then make that happen. I think this is something that we can hopefully with the help of machines do. And I think this is one of the things that will set us apart. Just imagine a better future and hopefully selling it to the rest of the human beings and getting them excited about and making it happen.

Jon Krohn:	00:38:18	Yeah, that's an interesting perspective. It could end up being maybe similar to the music example that you just described, where maybe AI can actually come up with a lot more detail around how a perfect human future could be. But unless there is a human that is conveying the idea to you and saying, "Let's go do it." It could be like a human that's being led by generative AI ideas potentially. On a much smaller scale, on the music note, something that's really exciting for me personally is I have never struggled to write melodies or chords of music, but for some reason I've never enjoyed writing lyrics. I haven't had the opportunity to do much of it yet because of existing commitments, but I hope to be able to find some time soon to be able to have lyrics be written automatically for me so that I can just add them to the melodies that I've created. Yeah, it's a personal example of exactly what you were just talking about with an artist potentially being able to augment aspects of themselves.
Bernard Marr:	00:39:30	Yeah, 100%.
Jon Krohn:	00:39:32	Related to the idea of machine creativity and art and c ulture. Back in November in episode number 731, we had another futurist named Nell Watson on the show, and we had a fascinating conversation. She got me thinking about how it's conceivable even today. There's no reason why what I'm about to describe couldn't already be happening today, where you set off machines in a simulation. There's been games around for decades, like Sims, where you can create a little person and it interacts with other humans. It is sometimes with other humans or sometimes just with other simulated humans, and they go about their day. They go to work. They come back home. They make the bed, whatever. They're programmed to do routine things, but there's some randomness in there.

	00:40:30	You could have something like a Sim character that's powered by a powerful large language model, both for conversation as well as for, say, art generation. And this simulated character could be a painter. You could program it to say, "I want you to be a painter." Then you have some other simulated person that you programmed to be a poet, whatever. These interact with each other, and conceivably you could have hundreds or thousands or millions of these simulated individuals interacting with each other and creating their own musical trends and artistic trends. And it could all be happening on computer servers without even really humans observing it. Also, theoretically, after long periods of that kind of evolution, some human could peer into this system and discover, "Wow, look at what they've come up with." This is really interesting. I had like to share this with the humans around." I don't know. That was something that I hadn't thought about before and it seems like it's related to the conversation we were just having.
Bernard Marr:	00:41:38	Yeah, completely. I always think you can then again use current platforms like Spotify example to just use and try and experiment with some of these generated music types that have just been invented to just put them randomly on people's playlists and say, "Okay, do we actually like it? Do we engage with it? Do we listen to it again?" That will be interesting in that you then actually test it against humans and see do they like it and what bits do they like?
Jon Krohn:	00:42:12	Yeah, very cool. Lots of crazy things happening in real time. Sora, one of those. We were just talking about image generation, but OpenAI Sora video generation in a Forbes article that you recently wrote quote, unquote, "Stunned the AI community and is two to three years ahead of expectations." Why do you think this is such a big leap forward? I have my own opinions too, but I would love to hear yours. And do you have advice for media

organizations that are trying to combat misinformation now that generative video is becoming so incredibly capable?

Bernard Marr: 00:42:49 Yeah, for Sora, we earlier talked about the fact that we regularly get surprised by how fast these tools are developing, and I felt that I was keeping a really close eye on generated video and how generative AI was helping with creating video. I was seeing how it could generate backdrops for movies. How it would help us to edit things better and faster. When I saw Sora, I was blown away by the fact that it could produce almost movie quality video based on scripts and based on prompts. For me, a huge concern is about what it means for actors in the future? What it means for filmmaking? But also huge excitement around how it would just democratize another modality, that it would democratize filmmaking. I could now sit down and come up with this super creative plot and make a film. And if this technology develops in any way on the trajectory that we've seen it develop, then we will have that in a year or two where we can create entire movies based on this.

00:44:17 That for me is super exciting. Again, if we are not only using generative AI to create a specific movie, but generate a movie as we are watching it to almost emerge based other inputs on what we like, if we then combine it with some of the data we can get from headsets, like the Vision Pro headset that monitors your eye movement so you can then see, "Okay, I'm watching this movie, but I'm really watching this particular character in this movie because I like that. I'm fascinated by this character." This character can then become bigger in this movie and take a bigger role in this. The movie could almost emerge based on feedback that we are giving it. For me, that has so many huge implications of how we are making films and the future of filmmaking. Yes, it is a huge deal and it will be super interesting to see where this is going.

Jon Krohn: 00:45:20 Since the start of April, I've been offering my Machine Learning Foundations curriculum live online via a series of 14 training sessions within the O'Reilly platform. My curriculum provides all the foundational mathematical knowledge you need to understand contemporary machine learning applications, including deep learning, LLMs and AI in general. The linear algebra classes are wrapping up soon, but my calculus, probability, statistics, and computer science classes are still to come. The first two calculus sessions are available for registration. Now, we've got the links for you in the show notes, and those will cover all the essential calculus you need for machine learning. Calculus level 1 will be on May 22nd. Calculus level 2 will be on June 5th, and registration will open soon for Calculus levels 3 and 4, which will be on June 26th and July 10th. If you don't already have access to O'Reilly, you can get a free 30-day trial via our special code, which is also in the show notes.

00:46:10 You're exactly spot on the things that I find most interesting about this too. I constantly think to myself about how film will be transformed because it could be more like a choose your own adventure kind of book, but with unlimited avenues. You're not choosing between two or three paths at a given step. You are at any possible instant choosing any possible direction you could dictate that.

Bernard Marr: 00:46:34 Yeah, and for me, it's almost merging video gaming with music making. I think about my kids that spend quite a lot of time playing with their friends in video games. At the moment, a good example is these non-player characters that you sometimes encounter. If you're playing Fortnite, there might be this other dude coming along and then you have a conversation with this person, but that conversation is pretty limited today because it's prescripted or some programmer had to come up with what this person looks like and the conversations you can

have with them. In the future this can be all completely dynamic where the AI will generate a character based on what you've just experienced. You can have any conversation with them because it can be fueled by large language models. This for me is, again, super exciting.

Jon Krohn: 00:47:36 Yeah, it's going to be wild. Something that I think of as a corollary to this is that I suspect films with only one possible avenue through them will still probably exist because there is something about the shared human experience of those. I think they compliment each other. I don't think we'll see traditional film as we have it today with one storyline disappear, but these completely dynamic films or experiences, they're inevitable. They're happening soon, we actually-

Bernard Marr: 00:48:13 As you say, they're already happening to some extent. It is changing. Where this will all go and where we will land, we don't know yet, which makes it all very exciting.

Jon Krohn: 00:48:24 A past episode that listeners may be interested in that is related to this is episode number 711 with Ajay Jain. In that episode, he's the CEO of a company called genmo.ai, which is a generating motion, and they render video. You can go to their website right now and provide it with a still image and have that be turned into a video that's a few seconds long. Sometimes it's very cool. They also generate 3D assets for filmmakers, which is niche and something that will happen more and more. You don't need to be granular in the weeds on designing those assets anymore. It can just be a text prompt.

Bernard Marr: 00:49:07 While you were talking about this example, I just remember the second part of your question. Am I worried about deep fakes and misuse of this information? This is probably one of the biggest concerns I have around generative AI, that there's a real risk that in a few years time, literally everything we will see online is AI

augmented or fake. This is already happening to a small degree where very few people put a real quick picture onto their Instagram, they will spend a bit of time making sure that the sky's a bit more blue and the sea is a bit more clear, and the beach, maybe if they didn't like some of the people in the background they'll erase those.

00:49:59 We will see less of reality in the online world, in the digital world. Obviously, we can now create deep fakes to a level that is almost indistinguishable from watching a president of a country saying something or a business leader saying something. I have real concerns about how we make sure people develop those critical thinking skills to think, "Okay, where's this information potentially coming from?" And at the moment, I believe the vast amount of people are not even aware of how powerful this technology is and how capable it is. We need to educate the world and make sure that people understand that it's now super easy to create videos or voice messages of anyone saying anything that they've never said before and would never say.

Jon Krohn: 00:51:01 Yeah, the political abuse particularly concerns me. The example you made there on social media, also, it has the potential to make real life more depressing when you go to the real beach and you're like, "Ah, it's not as blue as it always is on Instagram." I'm taking a bit of a caricature on the point that you made, but I think you're absolutely right about that. That is concerning for sure. But the political issue, that is so huge because like you said, people need to turn on their critical thinking faculties. I think that we've seen with the increasing reach of social media around the world in the past decade, we've seen people prefer to remain in a siloed, often fake environment as opposed to being exposed to other views or potentially real information.

	00:52:06	It is as though for people at an extreme of the political spectrum or people that are brought to the extreme of the political spectrum by the social media feeds, they would prefer to turn off the critical thinking and just pretend that they're in a world that doesn't exist and then they'll vote as such. [inaudible 00:52:27].
Bernard Marr:	00:52:27	This is my concern as well, that we now live in this increasingly polarized world where we've almost lost this ability to have disagreements on a level where we can discuss things as humans and say, "Maybe there's a middle ground." Everything has to be left or right. Everything has to be very polarized. In this world, especially fueled by social media, people love content that just reaffirms and confirms their views and they say, "Hey, yeah, we've now seen this politician making this point." And this spreads so quickly that... Yeah, it's a big challenge and we need to tackle this as a society.
Jon Krohn:	00:53:14	Yeah, it sounds like people need to opt in. I don't know how we can force people to only follow sources that seem reliable. It's going to be a tough one. It's going to be an interesting ride over the next few years for sure as we figure that out. Moving from politics to business, another problem that generative AI is creating is it's creating even more data for businesses. In chapter 17 of your book you described this, how already today, even before generative AI is widespread, the average business is already swimming in data, and yet only a very small proportion is used by the business to drive decision-making. Generative AI, as you mentioned in chapter 17, will make this worse because we'll have way more data than ever before. How can businesses make the most of the data that they have and become more successful?
Bernard Marr:	00:54:13	So many different avenues to answer this question. From what I'm seeing, less than 1% of data that companies already have, that they own today that is ever used to

make any meaningful use of it. If we then add the data that they could potentially access and make use of, this shrinks to like .1 of a percentage. What we can do is we can start strategically approaching this and say, "How can AI help us with our business strategy? What are some of the biggest challenges we are facing as a business? The biggest opportunities? And how can we use AI to help us with this? And then what data do we need?" For me, your business strategy determines your AI strategy. This then determines your data strategy. We need this complete alignment across.

00:55:15 Generative AI also helps us do some of this because, again, a really good example from Amazon recently that they wanted to create this pay by palm method where you simply walk into a store and you say, "Okay, instead of using my credit card, I just use my palm print and this can allow me to pay for things." That was a really big challenge because it's not like your iPhone that already knows what you're looking for and just trying to confirm, is this you or not? Palm print, you have no idea who just walked in and has to be super accurate. What the challenge they had is they didn't have enough palm prints and especially enough palm prints of people wearing rings and plasters and having different skin colors. They use generative AI to generate millions of palm prints and use that information to then train the system, which then became super accurate.

00:56:20 Generative AI can help us create better data, synthetic data, less biased data to make our AI systems better in many cases. For businesses, I think really important to understand that it's not only the data they have in their organizations today that they can use, but the zettabytes of data that are out there. I was recently working for a construction company and they had a really big challenge. They wanted to have... In an ideal world, they said, "Wouldn't it be great if we could have a report that

tells us how much progress we are making on our different construction sites?" If there's this housing development, how many houses have they finished? Have they finished their streets? And in the past, this was super complicated. They needed to look at different project reports, send someone out to count things.

00:57:16 What they're now doing is they're using satellite data. Data that is being sold by companies that run these low orbit satellites that circulate our planet day in and day out. They create high-definition pictures of the entire planet. We can now combine those images with machine vision technology to then say, "Okay, can you give us an assessment of how much progress we are making on our construction sites?" Then they use generative AI to produce a report that analyzes this data. For me, this is so powerful. Something that was so complex before. The other thing that's enabled them to do is to compare themselves against their competitors. This was data that was completely inaccessible before, they can now use satellite images to not only track their own progress, but also the progress on their competitor sites. Yeah, huge opportunities in aligning your data strategy with your AI strategy, with your business strategy to make better use of the data we have in the businesses today, the data that is available, but also this huge opportunity to generate more data.

00:58:31 But I think a huge breakthrough for businesses will be this democratization of data analysis, because what happens at the moment is that most organizations have this bottleneck, this analytics function in their organization where they have people helping other business functions, produce reports, they analyze data, and the more data we have, the busier these people become, the more this creates a bottleneck. What I find so amazing with generative AI is how capable it is to analyze data. Even though these are large language models,

nobody really understands truly why they're so good at analyzing data. This for me will change this. It will eradicate this bottleneck that we have, so we don't need these analytics functions anymore to help us.

00:59:28 We can have a conversation with our data. We can say, "Hey, who are our most profitable customers?" The AI can then go off, look at your data, analyze it. It will also, I believe, help us move from this pull concept where we say, "Okay, I now need to have a question. I need to figure out where to find the data and how to analyze it to answer my question." To a push concept where the AI in the background will monitor a lot of data and say, "Hey, this looks interesting. It looks like this demographic is more likely to churn than others. I better push this to my marketing guys and give them a report and say, 'You might want to understand this in a bit more detail.'" For me, yeah, that is the biggest impact that it would democratize the analysis of data.

Jon Krohn: 01:00:17 Yeah, great points there. Things like having alignment between data and AI strategies. Using generative AI to create simulated data in situations like the Amazon pay by palm example that you provided and democratization of data analysis, enabling non-technical people to unearth insights and make better decisions without needing a technical person to be in the loop and create a bottleneck that way. Great ways that more and more business data can be used effectively by business. You've written so many books, so many articles on how businesses can leverage AI and other emerging technologies to improve their operations. Do you have any particular resources that you'd recommend of your own perhaps that our listeners should jump into if they're interested in transforming their business with AI?

Bernard Marr: 01:01:13 Yeah, absolutely. I see my role in this world to cut through the hype. For me, there are a number of books if

you want to understand data, if you want to understand AI, extended reality, the future internet. There are books out there to dive into. Then there are more technical books around data strategy if people want to develop a data strategy. Then there are books more general on future trends like business trends. I wrote a book called Business Trends in Practice, which looks not just at tech trends, but business trends overall and one on the biggest technology trends.

01:01:56 But I have to be honest, of all the books I've written, I believe that this Generative AI in Practice book that we are talking about here today is the most relevant book because of the fact that generative AI, I believe, is the most powerful technology humans have ever had access to. If anyone wants to start from me, that is a good starting point. If you're not into reading books, have a look at my YouTube channel. I constantly publish articles for my own newsletters on LinkedIn. I have a direct mail newsletter. I write for Forbes. Anyone who signs up to my newsletters will get all of those articles. There are great bite-sized pieces of content that really look at the latest trends, the latest use cases, and hopefully people can just carry on learning along with me.

Jon Krohn: 01:02:59 Nice. That jumps right to the final question that I always ask guests. You've already answered that with not only your great book recommendations of your own, Business Trends in Practice, and then the new GenAI in Practice bringing everything full circle conversation-wise, perfectly. Thank you, Bernard. Yeah, your YouTube channel, your newsletter... What are the best social media channels that people should follow you on? You've got 1.5 million followers on LinkedIn, I think? Last time I checked.

Bernard Marr: 01:03:27 Yeah, LinkedIn is by far the best channel to connect with me on. If you follow me in LinkedIn, you will see pretty much everything. Beyond this, YouTube and pretty much

any other... I'm on X. I'm on Instagram, but I think LinkedIn and YouTube are the key ones.

Jon Krohn: 01:03:50 Nice. Usually, what is my penultimate question is for a book recommendation other than your own. That'll be our final question today since we've already done how to follow you. Bernard, what book do you love out there that our listeners should read other than one that you've written?

Bernard Marr: 01:04:09 It's so hard to choose one, because I probably read between one and three books a week on future trends and AI. There's so many amazing books. If I just look at the recent ones I've read that made a really big impact and align with what I'm thinking, I would say The Coming Wave by Mustafa Suleyman, who is the co-founder of DeepMind and who paints an amazing picture of how AI will transform the society of the future.

Jon Krohn: 01:04:52 His startup was recently... Everyone seems to have been poached by Microsoft out of his startup. That's big news at the time of us recording. Great recommendation there. Bernard, amazing conversation. Such a great episode. So many different pieces to dig into with the infinite number of ways that generative AI is going to be transforming society. Thank you for opening our minds a bit to what will happen and to how we can make the most of it as individuals, as well as companies. Thanks so much, Bernard. It's been amazing to have you on the show. Such an honor, and maybe in a few years we can check in with some other book release that you have and see how all of the AI innovations are coming along.

Bernard Marr: 01:05:43 Yeah. Thank you so much for having me and hopefully we don't need to wait two years, because I'm currently working on AI strategy book that should hopefully be super relevant. I'm super happy to come on anytime you want me.

Jon Krohn:	01:05:56	Well, likewise, you also have an open invitation. Reach out as that book is coming out and we'll sort it out. Thank you so much, Bernard, and catch you again soon.
Bernard Marr:	01:06:05	Thank you.
Jon Krohn:	01:06:13	What an honor to have the giant of AI-driven business transformation on the show. In today's episode, Bernard Marr filled us in on how GenAI will pair with the energy, healthcare, and education industries to accelerate societal transformation across all aspects of work and life with tremendous potential for reducing inequality and improving quality of life worldwide. He talked about how Sora-like GenAI systems will result in widespread highly immersive entertainment with infinite experiential possibilities and how less than 1% of business data is used by a typical business, but GenAI could unlock the remaining 99% by removing barriers to data analysis, enabling non-technical people in business to unearth insights independently and ultimately make better informed business decisions. As always, you can get all the show notes including the transcript for this episode, the video recording, any materials mentioned on the show, the URLs for Bernard's social media profiles, as well as my own at superdatascience.com/777.
	01:07:10	And if you'd like to engage with me in person as opposed to just through social media, I'd love to meet you in real life at the Open Data Science Conference, ODSC East, today through Thursday in Boston. I'll be hosting the keynote sessions today. Tomorrow I'll be providing a half day training that introduces deep learning with hands-on demos in PyTorch and TensorFlow. And on Thursday I'll be providing a half day training on fine-tuning, deploying, and commercializing with open source large language models featuring the Hugging Face transformers and PyTorch Lightning libraries. Hopefully see you in the next few days. All right, thanks to my colleagues at Nebula for

supporting me while I create content like this Super Data Science episode for you. And thanks, of course, to Ivana, Mario, Natalie, Serg, Sylvia, Zara, and Kirill on the Super Data Science team for producing another excellent episode for us today.

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