The Future of Work podcast is a weekly show where Jacob has in-depth conversations with senior level executives, business leaders, and bestselling authors around the world on the future of work and the future in general. Topics cover everything from AI and automation to the gig economy to big data to the future of learning and everything in between. Each episode explores a new topic and features a special guest.

You can listen to past episodes at www.TheFutureOrganization.com/future-work-podcast/. To learn more about Jacob and the work he is doing please visit www.TheFutureOrganization.com. You can also subscribe to Jacob's YouTube channel, follow him on Twitter, or visit him on Facebook.

Jacob Morgan: Hello, everyone. Welcome to another episode of the Future of Work Podcast. My guest today is Martin Ford, New York Times bestselling author of "Rise of the Robots" and also a recent TED speaker. Martin, thanks for joining me.

Martin Ford: Thanks for having me.

Jacob Morgan: We met randomly at the Half Moon Bay New Times New Work Summit. We were both sitting outside in the freezing cold over a big fire pit, and then got to talking, and I'm glad we actually connected. [00:00:30] I read your book, and I'm sure a lot of people did, and it's a very interesting look at robots and AI and automation. Thanks for taking the time.

Martin Ford: Thank you.

Jacob Morgan: First question for you. I've got to ask. What was it like to speak at TED?

Martin Ford: It was exciting. I unfortunately was there only briefly, so I didn't get a chance to stay for the whole conference because I had another speaking engagement right before that in Europe, and then I flew there to go to TED [00:01:00] for like one day, and then had to be back to Europe again right after that. It was quick, but it was exciting. It's definitely a tremendous energy. I do a lot of speaking, but that one, you feel a bit more nervous going out there than you do for most, I guess. It's interest.

Jacob Morgan: Did you have to practice a lot?

Martin Ford: I did. Normally, I don't practice at all for most of my engagements, but most of the ones I do are much longer. I speak for 40, 45 minutes. This was, [00:01:30] I think, 14 minutes. You've got to get it pretty well choreographed just down to the last word in order to fit it in. [crosstalk 00:01:39] practice. I guess so. I'm not sure what happened. I didn't want to find out what happens if you stay out there too long.

Jacob Morgan: Did they find you? Did they reach out to you and say, "Hey, do you want to speak at TED?"

Martin Ford: They did, yeah. They sent me an email several months in advance, so it's a fairly long process [00:02:00] to get ready for it. They ask you to do rehearsal and all this kind of stuff, so it's much more elaborate than most of the events that I do.

Jacob Morgan: Oh, wow, you have to an in-person rehearsal? You have to go somewhere and practice?

Martin Ford: Not in person, but online. A bunch of people, like on a conference call, and they watch you and critique you and everything. Yeah, they make a pretty big deal out of it.

Jacob Morgan: Very cool. Hey, you pulled it off, [00:02:30] and I think your talk has well over a million views now, doesn't it. It's passed [crosstalk 00:02:34]

Martin Ford: Yeah, it's like 1.7 million or 1.8 million, so I guess that's quite a few people, assuming they watched the whole thing, I guess.

Jacob Morgan: Almost approaching two million. I'm sure any of listening would love to have two million views on an article, a video, or anything we do, so it's quite an accomplishment. Maybe you can give people a sense of what your day is like now. Starting when you wake up, what's a typical day like in the life of Martin [00:03:00] Ford?

Martin Ford: I really don't have a typical day because I travel a lot. Actually, Saturday I'm heading to Hong Kong, so once I get there I guess my typical day will be quite different than it is here. I'll tell you the things I work on. I spend probably 60%, 70% of my time now going around doing speaking engagements, talking about the topics that I addressed in the book. There is an enormous amount of energy and interest [00:03:30] in this whole idea of what do robots and artificial intelligence mean in particular for the job market and for society in general. I spend most of my time doing that.

I'm involved in a number of other projects, which take me in different directions. I'm working with the French bank, Societe Generale, to actually develop an ETF essentially, an EFT for investing in this particular [00:04:00] sector of the economy in robotics companies and especially artificial intelligence companies. That's pretty exciting. I've been working on that for several months, and we're very close to the point of releasing that, which will be called "The Rise of Robots ETF".

Jacob Morgan: What's an ETF for people that are not familiar?

Martin Ford: It's essentially what's called an exchange-traded fund, and it's a way to indirectly invest in [00:04:30] a basket of stocks and trade them as you would an individual stock. It's a bit like a mutual fund, except that you can actually trade it on an exchange. It became a remarkably popular way to invest now, so it's exciting.

Jacob Morgan: Very cool.

Martin Ford: Beyond that, I'm also involved in a startup company, which is quite exciting. It's not actually anything to do directly with artificial intelligence. It's [00:05:00] a company called Genesis Systems, and it's working on atmospheric water generation, which means extracting water directly from the air even the most arid regions of the world like in North Africa or the Middle East, in areas where, for example, desalination is not an option.

There's literally no water in many of these countries, in Saudi Arabia, for example. There's literally no ground water, no rivers, no streams, no lakes. The underground [00:05:30] reservoirs are nearly exhausted, so for countries like that, this will be really a game-changer. I'm quite excited about that.

This is no something you might normally associate so much with Silicon Valley, and in fact the company is based elsewhere, but it's more Elon Musk type thing than Mark Zuckerberg thing, I think. It's building something that's very tangible that's really a game-changer. To me, that's very exciting because I do think in Silicon Valley maybe there's too much emphasis [00:06:00] on digital stuff and especially on social media. I think it's great to have a chance to work on something that's very tangible and can really change the world.

Jacob Morgan: Yeah, you've got your hands in quite a few cookie jars there. That definitely sounds like some exciting stuff. Then a lot of people probably don't realize this, but you wrote a previous book to this one, and I suppose that book is what was the genesis for this new one. Maybe you can mention your previous [00:06:30] book, and how you actually got to writing this new one.

Martin Ford: Right. My background is I ran for many years a small software company here in Silicon Valley. It was just a small company that made development tools, mostly for Microsoft Windows. I started that back in the mid-1990s, when Windows was really a big place. It was attracting a lot of innovation.

Back at that time, [00:07:00] software was a tangible product. It was shipped on CD-ROMs, and there was usually a manual that came with it. It had to be put into a box and sent to the customer. There were jobs there. I had to hire people to do that, but I saw just in my own really small business how quickly that changed, how those types of jobs evaporated. Everything became more digital, and of course you see the same thing with music and with ebooks and so forth.

That may be what got me thinking about this issues, [00:07:30] that and being very close to the technology, seeing firsthand just what Moore's law has meant for computers in general, and especially for software development and so forth. Those things coalesced, and I really started thinking about this issue of what is all of this going to mean, especially as it develops into broad based used of artificial intelligence and robotics? What could it mean for employment across the whole economy?

After thinking about that, I wrote a book back [00:08:00] in 2007 to 2008 called "The Lights In the Tunnel" and that book, the title comes from a visual, you might think of it as an imaginary simulation I used in the book to explain the point I was making about what could happen to the economy if a lot of jobs disappeared. It really focused on this issue of how if a lot of jobs disappear because of robotics and AI, [00:08:30] then that really has a big economic impact because then you don't have consumers. You don't have people with money that can drive the economy.

That's what that book was about. I was a thought experiment in that area. I self-published that in 2009. Of course, self-publishing a nonfiction book doesn't really get you much attention. Basically, you just upload it to Amazon, and no one knows about it.

It took several years. I did try to do some marketing and so forth, but eventually the book caught [00:09:00] on to some extent and did well enough that it lead to an opportunity to write my second book, "Rise of the Robots", which of course is a traditionally published book, and obviously for that reason was able to get much greater exposure. That's how I fell into it.

Jacob Morgan: Very cool. Now the book has done very well. It's got hundreds of reviews on Amazon. I see it being referenced all the time. It's all over the media, so congrats on that book.

Martin Ford: Thanks.

Jacob Morgan: [00:09:30] I know the book came out in 2015, so it's been almost three years since the release of that book. Are there any changes since that book has come out that have altered your view on robots and AI and what this means for the future? Or do you think everything in that book is still 100% true today as it was three years ago?

Martin Ford: I think that it's overall still true. If anything, [00:10:00] the developments since then, in many cases, have exceeded my expectations. The last big AI development I talk about in the book was IBM Watson, which of course was very impressive, but since then we've seen AlphaGo and AlphaZero, everything that DeepMind is doing, which is in many ways even more impressive, especially since they were able to take AlphaGo and then generalize it into AlphaZero, something that is really becoming, while is still [00:10:30] narrow artificial intelligence, it's clearly becoming more general in its capability, its ability to begin at least to cross domains.

The other thing that's been remarkable is the progress we see in self-driving cars. I keep telling people that I think real self-driving cars that are generally available are still 10, 15 years away. I still believe that, but on the other hand, Waymo is in Arizona right now. They've actually got cars on the ground

[00:11:00] that you can hail and get into. Things are moving quite rapidly, maybe that this stuff develops even faster than what I anticipated.

I do think that certainly on the technology side, things are moving at least as fast as what I had suggested in the book. Clearly, the economic situation is more murky. We clearly don't have high unemployment rate right now in the United States. It's actually quite low, but on the other hand, [00:11:30] we do have a very unusual economy in the way things are operating. For example, we've got interest rates at zero. We have very little in way of inflation.

If you talk to economists, that's not really the way things are supposed to work. Unemployment and inflation are supposed to be inversely correlated, and now we see that they're both very low. There is unusual stuff happening in the economy, and I think to some extent that's probably driven by the inequality that's coming [00:12:00] in large measure because of the impact of technology. I think as things go forward, we could really see some fairly dramatic changes.

Jacob Morgan: If you were to take a step back and just look at what's happening in the world of work, and maybe if somebody hasn't read your book, how would you explain your perspective or your stance or your thoughts on what's going on in the world now to maybe somebody that's not familiar with a lot of these [00:12:30] themes and topics?

Martin Ford: Right. The core argument that I make is that I do think there is going to be a big impact on many jobs from technology, like artificial intelligence and robotics, and specifically what I'm saying is that any job that is that some level fundamentally routine and repetitive and predictable, meaning that if you come to work and you face basically the same kinds of challenges again, you're solving the same kinds of problems, you're in the kind of a job where what you've done [00:13:00] in the past broadly predicts what you're doing to do in the future.

By that, I don't mean that you come and do it exactly the same thing like standing on an assembly line doing something rote repetitive, but just that you're taking on the same kind of tasks. If there is data that really encapsulates the things that you've done in the past that a machine learning algorithm, for example, will be able to extract that information and figure out how to do those jobs.

We're beginning to see a big impact in a lot of areas where that's happening, like [00:13:30] everything from fairly lower skill office jobs to lawyers and even radiologists. Doctors that specialize in looking at medical images. That's beginning to happen already, and I do think it's going to accelerate, and it's going to be extraordinarily broad based.

No one is saying that all the jobs are going to disappear. There definitely are many kinds of jobs that are not going to be automated for a long time. One good example would be a nurse or [00:14:00] an electrician or a plumber. Most

jobs that really involved lots of creativity and building new things. These are things that we're not going to be able to automate for some time, but there are a lot of jobs that do fall into that category of being routine. Someone comes to work and they do the same kinds of things again and again.

It probably wouldn't be a bad estimate to say that half of the jobs in the economy are generally in that category. That's the [00:14:30] scale of what we're looking at, and that could just be quite staggering in terms of the economic impact, the social impact, and of course the political impact.

Jacob Morgan: I'm definitely going to touch on that in just a minute, but I know you're at the forefront. You get to see a lot of really cool stuff. You have probably seen AI and robots and automation doing things that probably most other people haven't seen. I thought maybe you could give any examples or stories of what you have seen [00:15:00] doing your research that maybe we're just not aware of. Anything you have seen or come across?

Martin Ford: As I said, I travel a lot to events. I often go to conferences and things where vendors have exhibits, and I have seen some pretty remarkable things. There are systems that can do customer service that combine natural language capability and artificial intelligence. They're getting remarkably good [00:15:30] at dealing with customer problems, even technical support problems, these kinds of things.

The call center jobs are definitely one area, I think, there's going to be big impact. You know that that's going to tend to fall into a so-called 80/20 rule, where 80% of the calls that come in are going to deal with 20% of the issues maybe. It gets fairly easy to build a system that really focuses on the most common questions. I think there are a number of vendors working on [00:16:00] that.

There are robots in a number of areas in healthcare, like pharmacy robots that I've seen in hospitals that are just incredibly proficient and do the thing that you most want from a pharmacist, which is to prepare medications and not make any error, and be able to do this at high volume with extreme reliability. I talked about some of these systems in my book, but they're getting even better and better.

I've certainly seen [00:16:30] the beginnings of more dextrous robots. This is something I haven't really seen firsthand because I think it's something that is going to happen, for example, in Amazon warehouses, but I know that Amazon last year had a contest where various teams competed to build robots that can do what the workers in Amazon warehouses now do. The way it works is the warehouses have got lots of robots already, but they've also got [00:17:00] lots of people What happens is that the robots, the Kiva robots in the Amazon warehouses will bring an entire shelf of inventory to a worker, and then the worker has to reach in there and grab the item off the shelf and pack that into a box to send to the customer.

The reason the worker has to do that is that the machines are not yet able to do that. They don't have that level of visual perception and dexterity, but that's going to change quite rapidly. As I said, Amazon did have a context last year where [00:17:30] teams actually competed to build a robot to do exactly that.

That's one area where I'm expecting a fairly big disruption fairly soon. Right now, you hear about Amazon hiring all these people for these warehouses. I don't know how sustainable that is. I suspect that it won't be long before those warehouses become a lot less labor intensive than they are.

Those are some areas. In the area of software, there's a lot of stuff going on. I hear from lawyers about [00:18:00] very sophisticated systems that are analyzing or even developing contracts, that kind of thing, that are doing the more routine legal work. Again, these are jobs that are done by very skilled people. We're not talking about blue-collar jobs or jobs that are done by people that didn't go to college. These are university graduates, law school graduates. It's a very broad impact, and there are lots of examples you can point to already.

Jacob Morgan: I think you even talked [00:18:30] about in your book, I believe, there was agriculture in there. There's lots that we're seeing, autonomous tractors, like [Rio Tinto 00:18:37], all sorts of different places are starting to invest in this. I think you're right. The impact could potentially be pretty great.

On the other hand, it's also interesting because there seems to be two camps that have developed. There are these, I don't want to call them, pessimists, but people that are more cautious. I don't know [00:19:00] what the right word would be, maybe fearful about the impact that automation and AI might have on the future of work.

Then there are other people that I talk to. For example, Nolan Bushnell, the creator Atari and Chuck E. Cheese. He was a podcast guest. I asked him this question, and I said, "There are a lot of people that are very scared about the future of work and AI and automation." His response was, "Look, these people have got to get a grip because as long as there's creativity and as long as we can come up with new things, we're always going to find new jobs and [00:19:30] new work and new things to do, and I am not worried about automation and losing jobs."

When you hear that, where do you stand on that? Do you think that it's a concern that we should have?

Martin Ford: I do think it's a concern. I don't fully disagree with that. I do think, what I would say as long as we have human creativity we will always create new things. There will always be new ideas, and people will also want more things in the future. They'll [00:20:00] want things in the future that today they can't even imagine.

A lot of economists look at that and they say, "Well, since people are always going to demand new things, then therefore that increased demand for new, unimaginable products and services in the future is clearly going to create the jobs." That's the way it has always worked in the past.

I would add a caveat there, which is that I think that's true. There is going to be that demand out there, but there is no assurance that [00:20:30] the work that needs to be done to create those new products and services or to deliver them can primarily be done by computers and by artificial intelligence or robots or whatever.

If you look at the new kinds of things that people want to do now, that we're demanding, a lot of those things are digital. People are spending more and more time on social media. They're playing video games. [00:21:00] In the future, they're undoubtedly going to want to spend a lot of time, I think, in virtual reality environments and so forth. Sure, there's going to be lots of demand there, but take a look at what that means.

There absolutely are some jobs there for people to create content, to create the software itself and the technology, but that doesn't solve a problem of employing 140 million people in the United States, the vast majority of whom are just average people. There are no jobs delivering tweets [00:21:30] or delivering virtual reality to people. There are job creating content within those environments and so forth, but those are pretty specific and limited.

The question is are we going to create opportunities for a really broad set of people? I think there are some real concerns about that. You are correct that there's a different range of opinion on this. That's one of the things that makes this fascinating. There are people like me that really worry about the impact on employment. There are other [00:22:00] people that don't worry at all, and some of those people are incredibly smart.

I bet you could find Nobel Prize winning economists who would tell you that this is a non-issue. It's silly to worry about this because history shows clearly that the economy always adapts and creates new jobs. These are people with the Nobel Prize, so we have to respect that point of view.

Then there are other people like Elon Musk, who forget [00:22:30] about the jobs, the problem is artificial intelligence is going to take over and potentially kill us all. You've got an incredible range of views on this from some very smart people, and that's I think one of the things that makes I really fascinating.

Jacob Morgan: What should we do then? I suppose that's part of the challenge is a lot of people hear these conversations in debates, and they say, "I don't know what to do. Do I listen to Martin Ford? Do I listen to Ray Kurzweil? Mark Zuckerberg, Elon Musk?" [00:23:00] All these billionaires and rich people and futurists and academic are all telling me different things. Should I be worried or not?

Martin Ford: What I think is that you've got to consider all those perspectives, but I do think that clearly there are enough people worried about this problem that it's a valid problem. It should be something that we should be concerned of. I would say also that, just to give you an example, one of the solutions that I proposed and that many others people talk about [00:23:30] is a guaranteed basic income. You hear Zuckerberg talking about that as well.

Now, that is a viable solution regardless of exactly what happens here. You can take the worst case scenario, where we really do have mass unemployment. That's an extreme worst case scenario. Then I don't see any other solution than having a basic income in that circumstance.

There's also a much tamer, you might call it the weak case of this, which is that, [00:24:00] okay, maybe we don't have mass unemployment. Maybe not that many jobs literally disappear, but maybe what happens is that all the jobs get deskilled. More and more of the good jobs disappear. We're definitely seeing this already, the good solid middle class jobs disappear. Even a lot of the high skilled jobs for people like lawyers and even radiologists disappear, and the jobs that are left are really these lousy, low-paying uninspiring jobs.

[00:24:30] Then a basic income is still a good solution, where you give people an income floor, and then maybe they'll still work doing these other jobs on top of that. Between what they earn from these low-wage jobs and the basic income, they have a decent income.

You don't have to believe in the extreme case. It's clear that there's a broad spectrum of possible outcomes here, but a lot of those outcomes are pretty negative [00:25:00] and definitely something to be concerned about. Whether it's a bunch of bad jobs that don't pay much, or literally no jobs, anywhere on that continuum is a real problem. It's definitely worth discussing this and thinking about possible solutions.

Jacob Morgan: You have a chapter in your book called "Is It Different This Time?" That's obviously one of the things that a lot of people keep mentioning. You mention a lot of economists always point to history, and they say, " [00:25:30] No, this has happened plenty of times in the past, and we've always created new jobs." Why do you think it might be different this time? What are the things that you're paying attention to that show that what we're seeing now is not what we saw in the past?

Martin Ford: Right. The two things I would really focus on in terms of what makes this time different is first, we've got thinking machines in a very limited sense. The machines are thinking. They're taking on cognitive capability, brain power. It's not about [00:26:00] mechanical contraptions displacing muscle power as it was previously. That is different. You can think of it as the machines beginning to encroach on the fundamental competitive advantage that human beings have, our ability to think, to learn, to adapt, to come up with new ideas. This is what sets us apart from everything else on the planet Earth, at least, and makes us

unique. It's what has [00:26:30] made us capable or remaining relevant as technology has progressed in the past. That's different.

The second thing is that this is just so broad based. It's going to scale across everything. The comparison I often use is to electricity. I think artificial intelligence is going to be a utility like electricity.

When people ask what jobs could be impacted by AI, or what industries could be impacted? I think that's almost the wrong question. A better question is what's [00:27:00] not going to be impacted by it? What industries or jobs can you think of that don't use electricity? Not many, so same is going to be true of our AI. This is going to be incredibly broad based. It will scale across everything. There aren't any areas of the economy or industries or jobs that aren't going to be impacted by this.

I think when you put those two things together, it does point potentially to a different outcome. Just to give a specific example, the classic example [00:27:30] that people will give is what happened in agriculture. Most people at one point used to work on farms. Then this powerful agricultural technology came along, tractors, combines, all the equipment. Now, the percentage of the workforce that works in agriculture in the United States is, I think, between 1% and 2%. Virtually no one works in agriculture anymore. Essentially, you can say that agriculture has become almost [00:28:00] completely automated.

Of course, what happened is that those people moved onto something else. First they left the farms, and they looked for jobs in factories. Later on, factories also automated, or they off-shored. They went to China, whatever, and now most people, about 90% of our workforce, works in the service sector.

In the past, what we've seen is this sector by sector transition, where fairly [00:28:30] specific often mechanical technologies have upended one sector like agriculture and later manufacturing. People have transitioned into other sectors of the economy, but for the most part, they've still been doing things that were still pretty routine. You went from doing routine work on the farm to standing on an assembly line, doing routine work in a factor, to now stocking shelves at Walmart. Those are all routine work.

Now, we've got this incredibly [00:29:00] broad based utility-like intelligence that's going to scale across everything. One thing it's going to do for sure is it's going to eliminate almost any kind of job that is fundamentally routine and predictable across the board and including most importantly in the service sector as well as in manufacturing. Those are the main reasons I think this time could well be different. I think a lot of people that look at this tend to agree with [00:29:30] that.

Jacob Morgan: In your book, there were a couple of companies that you looked at. McDonald's was one of them, for example. I had the chief people officer of McDonald's as a

podcast guest and the chief human resource officer of Accenture in the past. When I interviewed them, Ellen Shook, for example told me that at Accenture, they automated 10,000 jobs. They did this the year before last, I believe.

She said that they didn't lose any people during that process because this was in the finance space, and they had 10,000 employees [00:30:00] that were basically number crunchers. What they did is they retrained those employees to be more like strategic partners to their clients.

McDonald's, same thing. I know we keep hearing about kiosks and these types of things that are being implemented inside of retail, inside of restaurants, and when I spoke with David Fairhurst I said, "Look, you guys are investing heavily in kiosks, and a lot of people are saying that you're going to cut headcount." He told me that they, in some cases, have actually increased headcount [00:30:30] because what McDonald's is doing is shifting their model towards being more service oriented, bringing you your food, creating an experience instead of getting you your food quickly.

I hear these types of stories, and I wonder isn't how we use technology and AI a choice? Because a lot of the times when I hear these conversations, it makes it sound as if we have no choice. Technology's coming. It's going to impact your jobs. At the end of the day, isn't it the companies that are deciding to use these [00:31:00] technologies?

A company like Accenture or Microsoft can say, "Look, we want to use AI to replace jobs," or they can say, "We want to use AI to augment humans to explore new business opportunities, to look at new business models." Curious to hear your perspective on that.

Martin Ford: Sure. I think that's true, and it would depend on the company. I'll move in both directions. What I would say is that first of all you have to ask what's going to happen in the long [00:31:30] run. In the short run, it may well be that we don't see a large impact, but over, say, a decade or two, it could be much greater.

Many companies will be able to retain people and reorient people as you said with Accenture, but of course, that also relies on the capability of those workers to make that transition. If you've got a person that's really best suited to routine repetitive work, maybe it's [00:32:00] not so easy to retransition that person to be a strategy partner to a customer or something. It would depend on organizations and how well that plays out.

In the case of McDonald's, what I would say is maybe McDonald's is going to make a choice to become more customer oriented, but that probably means at the end of the day they're going to have higher prices than another fast food chain that doesn't make that choices, and chooses to go the route of automation. Maybe McDonald's ends [00:32:30] up being upscale fast food, and others take another approach that eliminates more labor and goes more

automated, and they have lower prices. We would have to see whether McDonald's can hold position against that.

I do think there's going to be a very powerful competitive dynamic. There are a few companies working already on robots to make hamburgers, so that's definitely something that's going to happen down the line. I don't know [00:33:00] if and when McDonald's will move in that direction.

It's interesting that in the fast food industry, while you don't really see yet extreme levels of automation, technology has already played a big role there in terms of effectively deskilling the jobs and making the jobs sustainably low wage jobs that don't require much training. It makes it possible for a company like McDonald's to [00:33:30] tolerate a very high turnover rate because it's so easy. They just plug someone else in the system because it's so mechanized.

Again, this isn't necessarily just about technology creating outright unemployment. It's also about technology deskilling jobs and making those jobs pay less and generally be a bit less desirable. The fast food industry is the poster child for that. One thing I would suggest is [00:34:00] you might see that in more area. You might see that in more types of jobs as technology gets better.

Jacob Morgan: You mentioned Amazon as well. Amazon is another classic example of a company that's automated tens of thousands of jobs, but has created probably hundreds of thousands of new ones. To your point earlier, you don't think that that's scalable, and so you think eventually Amazon is going to get to a point where they plateau, and then maybe their headcount start decreasing as their influx of robots starts increasing?

Martin Ford: Yeah, I think that's highly [00:34:30] likely. Also keep in mind, when Amazon creates a job very often a job gets lost in traditional retail space. It's actually more of a migration, where jobs are being lost at retail stores. Then they end up migrating to Amazon warehouse, which many people will tell you maybe isn't a good a job to begin with. I do think as the technology [00:35:00] progresses that at a minimum there will be less job creation in those warehouses, and there could well be an absolute reversal, where there's simply fewer people there.

Jacob Morgan: When we look at timelines, you mentioned one to two decades out. I suppose that's also an important point to mention because a lot of people are looking at what's happening now. For example, there was a study, I think, that was done in Germany. You've probably seen this, where I can't remember the exact years, but they looked over a couple [00:35:30] year period and they looked how Germany's reliance on automation and robots, if that impacted the number of human jobs. I think that they saw that there's was actually virtually no impact. Are you familiar with this study that I'm talking about [crosstalk 00:35:47]?

Martin Ford: Not particularly, but I definitely have seen studies that show, for example. One thing is that those studies focus pretty heavily on manufacturing.

Jacob Morgan: Yeah, that's true.

Martin Ford: Very often they look at industrial robots, and they'll come to conclusions. [00:36:00] If you look at countries like Japan or Germany or South Korea that have a really high robot density, it doesn't impact manufacturing jobs. Those are also export economies. You're looking at manufacturing, and you're looking at countries that are very strong exporters. Basically what happens is they can have lots of robots and still have lots of people, but they produce more and more then, and are able to [00:36:30] export it.

I don't know that you can take that rationale and apply it to when robots hit the domestic service sector because if you're going to have lots of robots and also lots of people, what that means is you're going to produce a lot more. You've got to be able to sell that somewhere. If you can't export it, you've got to be able to sell that output domestically, and it's not clear it works the same way [00:37:00] in the service sector.

Jacob Morgan: Also, you're looking at, you said, one, two decades, whereas all these studies ...

Martin Ford: Right. I would say I'm a really strong believer. The thing you'll often hear lots of people say, which is that in the short run we tend to overestimate the impact of these trends, and in the long run we tend to underestimate. If you're thinking in the next year or two or three there's going to be this massive impact, you don't see it, then you'll say, "Well, see, look? Nothing [00:37:30] happened."

Then when we get 10, 15, 20 years out, the impact may be a lot more than what you expect. I expect that that's the way this will in general play out. Ten to 15 to 20 years is just a wild guess on my part. I definitely know people that I've talked to that are deep into the technology, things like machine learning, who think that the impact could be much sooner than that. They think more in terms of five years.

It's very uncertain. [00:38:00] We really don't know how fast this is coming, and that's part of the reason I think it's really important to have the discussion and begin to think about solutions like a basic income because who knows? We may need that sooner than we expect. We need to start working on that, do some experiments and so forth so that we can begin to prepare for this, I think.

Jacob Morgan: I know some people that talk about UBI, universal basic income. They say it's great in terms of it provides money, but a lot of people also get [00:38:30] a sense of purpose and worth and value from their jobs. While UBI can make it so you can go to the store to buy milk, UBI won't make it so that you are not depressed to the point where you don't even want to get out of bed because you feel like your life has no meaning kind of thing. Have you heard that argument?

Martin Ford: Yeah, that's a valid argument. It's absolutely true that people need a sense of purpose. They need dignity. They need a feeling that, [00:39:00] I think the way that many people have said it, people need to feel that if they weren't there they would be missed. If you don't have that sense, then that's very damaging. That kind of loss of dignity and self-worth and hope is probably what, to a large extent, underlies the opioid epidemic that we see in the United States.

This kind of thing is just having a devastating impact on our fellow citizens. [00:39:30] If all of this gets a lot worse in the future, then you're right. It's a critical problem to solve. My feeling is that a basic income is part of the solution. This is actually what I talk about in my TEDTalk. People can go watch that, but one point is that a basic income is obviously minimal. At least anytime soon, it's not going to be this generous cushy thing where you can just sit around and do nothing. It's going to be a minimal survivable [00:40:00] income floor, and most people will want to do more than that.

If you had that basic income, and then you maybe had a job that's not that great, maybe the fast food job, whatever, you'd have the basic income plus the income from that other job. You'd have a significantly higher income, and maybe that would make you feel better.

The other thing is that even if people ae working per se, there are many other things that you can do to give you that sense of fulfillment and accomplish. You can go and volunteer in the community. People [00:40:30] do that, and that's important. Software developers do open source software. They don't get paid for that. It's not the case that the thing that gives you value and meaning in your life has to also be the thing you get paid to do that generates your income. That's not true. Those things don't have to be coupled. It's just important that you have both of those things.

Jacob Morgan: Fair point.

Martin Ford: The other thing that I do suggest in my TEDTalk and also in my books is that [00:41:00] I think the idea of just a pure flat basic income is a beginning idea. I think we can refine that. We can improve that, and one thing I've suggested is why don't we build some incentives into a basic income.

For example, if someone is going to school educating themselves, figure out a way to pay those people more especially at the high school level. I think it would be just disastrous if everybody dropped out of high school because they say, "Hey, you know what? I'm not going to get a good job, and I'm going to get a basic [00:41:30] income anyway, so why bother to graduate from high school?"

Jacob Morgan: Or you relocate to place where there is universal basic income, and then all the sudden everyone flocks to certain regions and abandons others.

Martin Ford: Right. For that reason, I do think it needs to be a national program. That brings up lots of other opportunities. I think if we had a national basic income that was the same everywhere, suddenly that would revitalize a lot of places that right now are struggling. Detroit, for example because housing [00:42:00] is really cheap there. Why not take your basic income and move to Detroit? You could live a lot better there.

It would actually cause some migration, and I think some new economic activity and revitalization in maybe cities that have not done well. Also rural areas that have been losing people and so forth. It opens the opportunity for lots of interesting things to happen if you had even a minimal basic [00:42:30] income. I do think it's a really interesting idea for the future. It's something that really deserves a lot more thought and experimentation.

There are some experiments going on. In Finland, they're working on it. Here in Silicon Valley, Y Combinator is going to do a project in Oakland. I don't think that's quite underway yet, but they're actually experimenting with it. The idea is generate data. What do people actually do when you give them a basic income? How do they act? Do they just stay home and play video games, [00:43:00] or do they become more productive?

The experiments that have been done so far are quite hopeful. They suggest that people don't just stay home and do nothing. They do take that money and invest it and do become more entrepreneurial and do positive things. I think it is quite hopeful.

Jacob Morgan: Yeah, I agree. It's definitely something worth exploring. Hypothetical situation for you. Let's say that you had to design a jobs apocalypse. Let's say [00:43:30] worst case scenario, robots, AI, automation, millions if not billions of jobs around the world are taken over. If you had to purposely create that, how would you actually ensure that that does happen?

Martin Ford: I would do two things. I would make sure that there's nothing to restrain the technology, which enables this because you do [00:44:00] hear already talk of a backlash, regulation, things that would tend to inhibit this progress. I would put in place for a scheme for basic income in parallel with that because I don't necessarily view this as the case where let's wait for that to happen and let's have a basic income. I actually think the two work hand-in-hand, and that you would want to scale the basic income in gradually as this progresses.

[00:44:30] By doing that, you actually help that happen. Because if you don't do that, a lot of bad things happen. Number one, you have a very obvious backlash politically. You have calls to stop the technology, to regulate this because our jobs are disappearing. People are losing their livelihood. That would slow it down.

The second thing that would happen is that it destroys the economy. Suddenly now, people have got no money to spend. People are terrified. People are losing their jobs. Maybe you [00:45:00] are looking at a possible financial crisis again because people can't pay their debts, which is what we saw in 2008. That's a whole bunch of bad things. You don't want that to happen, so again, that's an argument for having something like a basic income as strategy to address this, so that you don't have these big negative disruptions that would slow that process down. [crosstalk 00:45:24]

Jacob Morgan: What if you wanted it to happen? In other words, if you were trying to create [00:45:30] this negative scenario?

Martin Ford: Okay, so you want to have the apocalypse?

Jacob Morgan: Yes, I do want to have it. How can I make sure that it does happen? What would you do to ensure that it does happen?

Martin Ford: Just make sure there are no restraints on the technology. Maybe try to shut down the debate on this topic. Try to redirect blame from technology [00:46:00] to other things, globalization, immigration, things like that so people don't really realize that it's technology that's causing this to happen. It overtakes them quite suddenly. Quite frankly, it sounds doing a lot of things that are now being done.

Jacob Morgan: I was just going to say that [crosstalk 00:46:22]

Martin Ford: Keep our political system so polarized that we can't come up with any [00:46:30] practical solutions to address the issue and make it more positive rather than negative, things like a basic income. Unfortunately, a lot of things that we have in place right now seem to point in that direction of that negative income, potentially a crisis.

Jacob Morgan: That's not good.

Martin Ford: Yeah. To some extent, I think it is the nature of our system that when we talk about doing something really huge like having a basic [00:47:00] income, that's such a massive staggering undertaking from a political standpoint that is hard to see how it happens if we don't have a crisis. History shows that a crisis is what finally causes us to take action.

You can look back at the Great Depression, for example. That's what led to Social Security and unemployment insurance [00:47:30] and all the programs that we now have. We had those because there was a massive crisis. I suspect the same is true this time around unfortunately.

Jacob Morgan: Who's responsible for it? The reason why I'm asking this is because earlier you mentioned something about workers and individuals. I'm trying to figure out, and curious to hear your thoughts on this, who is responsible for solving this?

Obviously, there's some accountability on us as individuals to not just sit back and let things happen. [00:48:00] We probably need to take our own personal and professional development into our own hands, take courses, be aware of what's going on in the world. See where we might be able to pivot in our jobs and our careers. Probably government needs to step in. Companies need to invest in training, leverage community colleges. Who or maybe all these things need to happen?

Martin Ford: The way I view this is it's ultimately going [00:48:30] to be a political problem that's going to require government to do something, like a basic income. It's at that level. It begins with individuals becoming aware of this and starting the debate, starting the discussion so it eventually it rises to that political level.

Clearly, there's also a role for businesses, and this is something that varies a lot. I travel a lot to different countries, and the philosophy is quite different if you're in Denmark, for example, than if you're in [00:49:00] the United States. In Denmark, people believe very strongly that companies do have a very strong social responsibility. The role of business there is probably going to be a bit different than it is here, where we have a much more capitalistic view of things.

I do believe absolutely that there is a very important role for business and for wealthy individuals who may not be so much worried about being impacted [00:49:30] by this individually because, again, the whole economy depends on this. It's not just about jobs disappearing. It's ultimately about consumers disappearing. It's about not having sufficient demand to drive the economy, about people maybe not being able to pay their debts and all the bad things that can result from that.

It's a systemic problem, so everyone has a role certainly. That means the corporations and hedge fund managers and all those kinds of people should also be very [00:50:00] worried about this, and should be willing to have an honest discussion about this and accept that the reality that it probably is going to require, for example, higher taxes on people that are doing extremely well in order to fund these programs. It probably is going to require some intervention on part of government to craft solutions that allow us to have a sustainable and a sustainable [00:50:30] society going forward. I do think that's an important part of it.

Jacob Morgan: There's some business leaders that listen to this podcast. What advice would you give to those leaders that are running companies or managers that are leading people at companies when it comes to AI? What would you tell them?

Martin Ford: First of all, in terms of managing a business AI is going to be an enormous disruption. [00:51:00] It's going to completely redefine the way businesses compete. We often talk about human capital and how the people working for your company are your most important resource. I hope that will still be true, but artificial intelligence is going to be another kind of capital. It's going to be something else that you have to give enormous attention to.

Any business that isn't thinking about this issue and developing a strategy to leverage [00:51:30] it within your organization is really at risk of falling behind and becoming irrelevant. There's that, and then there is the impact on the workforce and the awareness that this is going to have big impact on jobs in your organization. You're going to have to have a strategy.

Maybe if you're lucky, you can figure out a way to retain people and not lay people off and redirect them. I think in many cases, that won't be possible, so then you have to think about humane ways to [00:52:00] downsize where that's going to be necessary. These are all important issues.

Then finally, as I was just saying what is your responsibility as a citizen, beyond your organization? If you're a corporate CEO then you have influence. It's important to engage in this public debate as well and to not just be [00:52:30] narrowly selfish about what's good for your organization in the short run in terms of what you're willing to think about. We need to craft a sustainable solution that's going to work for everyone, and as I said, that probably involves taxation on wealthy individuals, on businesses and so forth because if someday we're going to have something like a basic income, we're going to have to pay for that.

Jacob Morgan: What advice would you give to individuals, so non-managers, non-executives, [00:53:00] just people that have jobs?

Martin Ford: The best advice I could give to anyone, whether you have a job now, or maybe you're in school thinking about what you should study for the future is avoid things that are fundamentally routine, repetitive, and predictable. If you're going to get a job where you come to work and you do the same stuff again and again, that's a job that's going to be threatened. If you're doing that now, if you are sitting in front of a computer, manipulating information [00:53:30] in some relatively predictable way, cranking out the same report again and again, the same analysis you should know that this risk is out there. It's on the horizon, maybe not in the too-distant future.

Try to transition away from that and toward things that are more creative, where you're generating new ideas, building something new. Thinking outside the box, and [00:54:00] try to transition to things that really have an important human element, where you are working with other people or creating deep relationships with other people.

That could be something in healthcare, a caring role that involves empathy, a nurse, a doctor, where you really have to connect with a person. In the business world, the kind of role where you really need to have a deep interaction with clients. Build a sophisticated relationship with clients to understand their needs and [00:54:30] their views and so forth.

Jacob Morgan: The human aspects, I think are very ...

Martin Ford: Right. Those are the hardest things to automate right now. We can never say never. Twenty, 30 years from how, who knows? Maybe even those roles, machines are going to be better. For the foreseeable future, those are the safest areas. You do not want to be sitting in front of a computer doing the same thing. [crosstalk 00:54:52] Even if it takes a PhD to do that job. You know what I'm saying? It's not dependent on skill level of education. It's [00:55:00] the nature of the work.

Jacob Morgan: I have a couple questions that people on LinkedIn wanted me to ask you. Before I ask those, really quickly, if you had to give the United States a grade on how prepared we are for the future of robots and AI and automation, what grade would you give the United States?

Martin Ford: Right now, pretty low, probably a D in terms of being prepared for the impact on society. [00:55:30] That's because we, relative to many other countries, we don't have a very adequate social safety net. You'd have to give the country a low grade even more generally in terms of preparing for anything, any economic disruption, in terms of being prepared for the impact of a recession. We get a low grade just because our social safety net is not adequate.

We've finally gotten universal healthcare, sort of, but [00:56:00] the current administration is doing everything it can to destroy that. It's a D or even lower overall, which is really unfortunate.

Jacob Morgan: Any countries that you think get high grades?

Martin Ford: Countries, Scandinavian countries that have better social safety nets are definitely better positioned to weather this kind of an impact that we are. That doesn't mean that they get an A because even those countries, their systems might not be sustainable under a really big impact. [00:56:30] Those countries are also in some cases experimenting with the basic income as an alternative to what they have now. Certainly, they're going to do better. Countries like Japan that are really just more cohesive and have different culture might be better off too.

Jacob Morgan: Less divided.

Martin Ford: No country in the world would get an A in terms of being ready for this. It's something entirely new. We're feeling our way into the future, and we don't really know [00:57:00] how to adapt to this. It's something that we're going to have to invent as we go along.

Jacob Morgan: No country gets an A, but most countries are doing better than the United States. We didn't even talk about China, and their massive impact. I think, what was it, by 2030 they wanted to be the world's leading AI hub? I think it was 2030 or 2025. It seems like [crosstalk 00:57:22] Go ahead.

Martin Ford: Yeah, I should just say, when I give the country a D, I'm talking about our ability to adapt socially and economically. [00:57:30] In terms of the technology, we certainly get a much higher grade than that. When it comes to AI, we are at the forefront. In many cases, we're getting an A in terms of doing the research into artificial intelligence and creating these technologies. What I worry about is our ability to adapt to these changes.

China is certainly getting a very high grade on the technology fronts as well. They may have some advantages over us where we're in a race there, which [00:58:00] maybe we should be a bit concerned about. In terms of China's ability to adapt to this socially and economically, that's an unknown, but they are clearly an authoritarian society, becoming more so by the day it looks like, and you could argue that their ability to turn on a dime and adapt may be in some ways better than us too. That's also potentially something to keep in mind.

Jacob Morgan: All right, now a couple of questions for you [00:58:30] from LinkedIn. First one, from Michael Flannigan. He says, "We often take inspiration for our life direction from significant people in our lives, peers, friends, mentors, many of whom we develop these inspirational relationships with through work situations. How does he," being you, "Foresee those inspiration forming connections might change when some, many, or most of the contacts are filled with non-human actors? And does he think we could be inspired by [00:59:00] a non-human actor, or does that require humanity?"

Martin Ford: That's a good question, but yeah, I absolutely believe that artificial intelligence will become inspiring. I think we in the future might have mentors that are AIs, that work with us to help us develop as people. [00:59:30] You see the beginnings of that now. You look at Amazon's Alexa, where a lot of kids turn to that for help with their homework and things. That kind of thing.

In the future, it will get better. There are dangers that come with that in terms of people losing track of the line between what's technology and what's human and so forth. I suspect a lot of issues there. [01:00:00] Absolutely. A lot of the inspirations that we look to people for are going to come from machines in the future. I have no doubt about that.

Jacob Morgan: Next question from Marla Hedsell. She says, "Martin Ford's book is an excellent read, but without a doubt a bit bearish on the near- to medium-term. I was written a couple of years ago, so would be interested to know if he has seen any recent developments that serve as bright spots and give him a sense of optimism?"

Martin Ford: [01:00:30] I am optimistic in the long run. I think we'll solve this problem. We'll muddle through, and if we do in the long run, it's very optimistic. It could lead to something like the Star Trek economy, where no one has to do a boring job, this drudgery, and everyone's got a lot more freedom. I don't view myself as a pessimist.

I do think in the short- to medium-run, there's going to be a lot of stress on the economy and [01:01:00] on society, and I think, again, I'll talk about the opiod epidemic. That's something that has really become notable and a big issue since I wrote the book. At the time I wrote the book, I wasn't aware of that. More people have died from the opioid epidemic than in the Vietnam War. It's really quite astonishing.

That is happening in part because of the impact of technology, and [01:01:30] it's not mass unemployment yet. It's just the impact on the kinds of work that are available to a lot of people. I do think there are reasons to be really concerned. You don't have to be extreme. You don't have to believe that all the jobs are going to disappear, or half the jobs will disappear, or anything like that. Just look at these trends and how they're playing out and the impact you see already. I wouldn't be so optimistic as to not take [01:02:00] this seriously. I do think we need to take it seriously.

Jacob Morgan: Fair enough. Do you have a few more minutes so I can ask you these last few questions, or do you need to go?

Martin Ford: Sure, yeah.

Jacob Morgan: Okay, perfect. The next one is from Heather McGowan, and she asks, "What jobs will technology replace? How do we use technology to unleash the potential of humanity? At the end of the day, all of these innovations should be in service to humans." I think she's saying, I probably cut off some of her question, how do we move the conversation from what jobs will technology [01:02:30] replace to how do we use technology to unleash the potential of humanity?

Martin Ford: Right. What that is ultimately the idea. There's a great quote from Demis Hassabis. That's the guy that lead DeepMind, that worked on AlphaGo and stuff. What he said again and again is that he wants to solve artificial intelligence, and he wants to use that to solve everything else. That's the ultimate objective here.

As technology advances, [01:03:00] jobs have always disappeared. That was Adam Smith's whole point of the division of labor and how things progress. I just think that's going to accelerate. Our objective is to come to terms with the fact that a lot of the kinds of jobs that we have today, especially all the more routine jobs are likely to disappear, but that's not a bad thing as long as we can take care of those people that will lose those jobs and will not have the ability to easily transition to something else. That's [01:03:30] where the basic income or some other plan like that comes in.

The idea is to not hold this back, to put a wind behind it. Then we're going to get all this amazing technology that's going to be leveraged on behalf of technology that will create now products, new experiences, new possibilities, new ways to engage, to enhance ourselves that don't exist today, as well as help up solve

some of the big problems out there. Climate change, [01:04:00] clean energy. AI is going to be critical in solving all of those problems. That's really the vision.

Jacob Morgan: I like it. It sounds very optimistic. Rose Morishida, I think that's how you say your last name, Rose, she says, "What types of skills should we be investing in to develop future leaders? This is actually going to be a new book that I'm going to be working on, just started, it won't be coming out for a while, hopefully 2019, 2020. I'm also very interested in this. [01:04:30] When you think about leadership of the future, what skills do leaders need to have?"

Martin Ford: It's a difficult question. Definitely an understanding of AI and robotics and how that fits into the strategy of a corporation is a big part of that. Clearly, being a leader in the future is not just going to be about leading people and running a meeting [01:05:00] with a bunch of people in it, and those kinds of skills that might have been what people focused on in the past. It's going to be about integrating human capital with artificial intelligence and digital capital and all of this and playing that role.

One of the things that I worry about in terms of leadership is that make it harder to really develop people with good leadership skills in the future because a lot of entry level jobs are going to disappear. [01:05:30] One thing organizations should worry about a little bit is that they might have fewer people coming in at the entry level to really get on that ladder that gives them the various skills to really become a CEO in the future because a lot of the roles that someone moving up through the organization might have taken on in the past might end up being automated, and those jobs aren't there anymore.

[01:06:00] We may have to think new ways to have people develop the skills that they need if they're not actually going to have an opportunity to work in the kinds of nuts and bolts routine jobs that once was an important part of their training. That may be a big challenge for figuring out how to develop the people that are really going to be the high level leaders of the future.

Jacob Morgan: Last few questions for you. Next one from Claudia Founder. Her question [01:06:30] is simple. "What are the new jobs that may arise?"

Martin Ford: Certainly lots of jobs surrounding robots and artificial intelligence. Machine learning and data science are just ... If you have the mathematical ability to do that, and it interests you, you should do it because you can make enormous amounts of money by acquiring those skills. That's going to certainly be important going forward.

[01:07:00] In general, as more routine things disappear, there may be opportunities for more creative things, things that have a more human element. Those are the areas that I think will be important in the future. It may be the in the future studying humanities or art or something like that is actually more

valuable in a relative sense than [01:07:30] it is now because those are the kinds of areas where more opportunities might develop.

Jacob Morgan: Interesting that those are the areas that most schools are actually cutting in favor of moving towards other areas. Hopefully, we'll see a resurgence in that because I think a lot of people are starting to believe that that is very important for our education. Our next question, last two for you. From Sarah Danzi, I think that's how you say your last name, [01:08:00] Sarah. She says, "What does this mean for how we need to be investing in ourselves, and what does this mean for how organizations need to better support skill development of employees?"

Martin Ford: Definitely, even if you don't buy into the more extreme scenarios that people talk about, maybe you don't think a lot of jobs are going to disappear, one thing I think everyone agrees on is that things are going to move faster. You [01:08:30] may work in a job, but probably that particular job or what you're doing is either going to disappear or it's going to change dramatically in a very short amount of time.

Everyone, the idea that you go to college for four years, graduate, take a job, and then you're doing that job for your career, that's over with. I don't think it exists anywhere anymore. Everyone is going to engage in lifelong learning, and the good news there is that technology is creating terrific opportunities there for people to [01:09:00] engage in lifelong learning.

You look at companies like Coursera that have created all these online courses, often that are free, or even if you want to get certification in a particular area. It's only like, I think, less than $100. It's pretty cheap, so it's a massive resource out there. It's a really terrific way to learn. People should be leveraging that, for sure.

That's going to be increasingly important both for individuals [01:09:30] and organizations, to take advantage of these opportunities out there to engage in lifelong learning. No one can afford to pretend that that's not going to be necessary. If you want to remain employed and relevant, you're going to have to continue to learn throughout your career.

Jacob Morgan: Do you think colleges are still going to have a place? Are kids that are born in five years, is it still going to make sense for them to even go to college, to university?

Martin Ford: In five years, I would say certainly yes. I think [01:10:00] colleges are always going to be with us, and that's especially true of those colleges that have strong reputations. Stanford and Harvard and MIT and schools like that are not going anywhere. They'll always be there.

What I would worry more about are there are lots of schools out there that are not particularly well known. They may have just a very local reputation, but they

still are very expensive. It costs a lot of money to go there, and I [01:10:30] do think it's possible in the future an online alternative could develop that allows you to get a credential that employers and maybe graduate schools would accept.

Maybe through companies like Coursera or something else that that type of thing, and a lot of people would take a look at that, and they'll say, "Look, I can do this online at much lower costs. Maybe I'm getting lectures from people at Stanford and MIT rather than my local professor at this other school, so I just don't really see the advantage in attending [01:11:00] this local school that most people have never heard of." That could be very disruptive because in the United States, there are thousands of colleges and universities. I think something like 3,000 or 4,000, and most of them you probably haven't heard of.

That could be very disruptive, and if that happens then that would also disrupt a whole lot of jobs for teachers at those schools. I can imagine that happening, so that [01:11:30] a lot of people do seek online opportunities for college degrees. That's quite possible.

Jacob Morgan: And last question for you from Hans Ackerman. He says, "Ask him about stone tools, symbolic language, and agriculture, and spinning Jenny," which I had to actually look up what a spinning Jenny was. I don't know if you know what it is, but I had to look it up. Then he says, "Do we need to fear and plan for an unknown future?"

Martin Ford: I do. When we talk about spinning Jenny, [01:12:00] he's talking about the Industrial Revolution, and I think that's what it's referenced to, the Luddites and the weaving machines and all of that.

Jacob Morgan: Yeah, exactly.

Martin Ford: There was disruption. Okay, there were riots. Economists look back at that and laugh at those people, but those people, we shouldn't laugh at them because they were losing their jobs. No one's going to be happy about that. In the past, these disruptions were a big deal. [01:12:30] They weren't like a couple of days, and then it was over with. It sometime went on for decades and had a big impact.

This time around, we're looking at very likely a disruption at least that big. It could be much bigger than that. It could well be for many people almost permanent, that maybe there really isn't a significant recovery in the job market, at least for some kinds of jobs this time around.

Of course, we have to worry about that. That doesn't mean that we should panic and hide under the bed. It [01:13:00] means that we should engage in a discussion and talk about these possible outcomes, and again, no one knows what the outcome is going to be.

In my book, I present one argument that I think is an important argument, but I'm by no means saying I'm right and everyone else is wrong. What I'm saying is that this is one possible outcome. Let's look at all the possibilities and have a discussion about this and begin to do some scenario planning and work out solutions like [01:13:30] a basic income I keep mentioning that could be put in place if things turn out that we have a real challenge. I think it's really important to have our eyes open and be willing to engage with this. We can't afford to just sit on our hands and wait for whatever happens to happen. We need to think ahead.

Jacob Morgan: You mentioned the scenario planning. Of course, this is something a lot of futurists train in and Shell is famous for their scenario planning. If you had to maybe [01:14:00] pick three scenarios for what might happen. Obviously, one of them is very clear. You talked about it in your book that we might reach a point where we see a lot of unemployment, and we see these negative consequences that might happen. Are there any other scenarios that you think are possible?

Martin Ford: Sure. Three broadly, the first one would be the true catastrophe, mass unemployment. Which means lots of people unemployed. [01:14:30] No one has any money to spend. The economy pretty much collapses. Ugly scenario, that's the worst case scenario.

The middle scenario is where, it looks a lot like what we have now. Inequality, stagnant wages for most people, maybe declining wages for most people. The quality of jobs is declining. People coming out of college very often can't find a good job that really gets them [01:15:00] on a track to a good career. They end up working. Maybe there still is that job at McDonald's, but now maybe a college graduate has to go take that job because he or she can't find anything better. You already see that with Starbucks certainly.

The middle scenario I'm thinking of is that just worsens somewhat and continues and jobs get deskilled, and there are jobs out there, but the jobs suck. There's more unhappiness, [01:15:30] more political division, maybe more scapegoating. People still pointing at immigrants and so forth as the cause of the problems, when really it's technology that's causing the problem.

Then the other scenario is the one that people who fundamentally disagree with me, my point to, and that's maybe I'm wrong about this, and things do adapt, and there is significant creation of jobs that are within the capability [01:16:00] of the people that lose jobs as Uber drivers and taxi drivers and truck drivers as the self-driving cars come online, but there are other opportunities out there created. Things that we can't foresee now.

My argument had been that I'm a bit skeptical of that. That doesn't mean that it's not possible. That certainly has to be one of the scenarios that we can consider. That would be the most optimistic one, I guess.

Jacob Morgan: We should probably plan and take action for all three and assume any [01:16:30] one of those might happen, or maybe even some of them will happen at the same time in different parts of the world. Probably the best piece of advice is just be aware of what those scenarios are and take actions to be prepared for either one that might happen.

Martin Ford: Right. Exactly.

Jacob Morgan: Martin, you've been very generous with your time. Any last parting words of wisdom that you would like to embark on the podcast listeners, and then I'll ask you where people go to get access to your book and to you.

Martin Ford: [01:17:00] I truly believe that regardless of how this ultimately plays out, it's going to be an important issue one way or another. This isn't a fad type thing where, okay, we're talking about this for a couple of years and then it disappears, and no one worries about this anymore.

I think this is going to be a continuing, probably escalating issue. No one knows exactly how it's going to play out, but it's going to be very important, so I do encourage everyone to think about this. [01:17:30] Read about it. Become conversant. Make this an important part of really your life, thinking about what this challenge means for the future, for your family and for society because I don't think it's going to go away.

Jacob Morgan: Where can people go to learn more about you, to grab your book, anything that you want to mention?

Martin Ford: You can find me on Twitter. That's where I'm most active, @MFordFuture. Mostly what I do is I tweet out links to [01:18:00] articles and other things that I see online that are interesting and illustrate what I'm talking about. I really enjoy that. I've also got a website and an infrequent blog at the same thing, MFordFuture.com. Those are the two main places to look me up.

Jacob Morgan: Of course, your book is available everywhere. "Rise of the Robots" is what it's called. It's still doing very well. A lot of people are reading it, talking about it. I'm assuming that's available anywhere [01:18:30] you can pretty much find a book?

Martin Ford: Yeah, hopefully in a bookstore if you can find one, and certainly on Amazon. It's been translated into about 20 languages now too, so people in other countries should also be able to find it.

Jacob Morgan: Wow. I didn't know that. Congratulations on that. Martin, again, thank you for taking time out of your day to speak with me.

Martin Ford: It's been great. Thanks a lot.

Jacob Morgan: Thanks, everyone, for tuning in to this week's episode of the Future of Work Podcast. Again, my guest has been Martin Ford, New York Times bestselling [01:19:00] author of "Rise of the Robots". I've read the book. It's awesome, so make sure to check it out, and I will see all of you guys next week.