EPISODE 2 ADOPTION
VIDEO TRANSCRIPT

Amber: This is a classic disruption story. When Soviet communism collapsed, the small, newly free Baltic country of Estonia didn't have much in the way of technological infrastructure. They didn't even have a working phone system. Finland, their neighbour to the north, offered them their old phone system for free to help get them on their feet. With a tiny population of just about a million people, a rusted out communist economy, and pressing needs across society for investment, this would seem like a no brainer. Get the phones working and focus on other things. The Estonians made a different choice. They said, "No, thanks very much, but the future of phones is mobile, and that's what we're going to build, and we're going to also focus on the Internet, where data is really being shared." It was part of a broader strategy for the country to leap from the vacuum tube era to the digital age in a generation, and it has by nearly all accounts been widely successful.

Estonia is now regarded as pretty much one of the most wired countries on earth. You may have heard of Skype, which was created by Estonian coders who grew up in that post-telephone world their government created. It rivals Israel for startups per capita, and its government provides virtually all services online with a seamless grace that leaves bureaucrats and citizens of other countries gasping. Now with the AI revolution in full swing, it's perhaps not surprising that Estonia wants to be part of that as well. In our last episode, you may have heard Prime Minister Justin Trudeau say that he and his government are watching Estonia closely, so we figured we should be too.

It's all part of this episode about adoption. How does AI work in the real world of businesses and governments? What's working and what isn't?

Jodie: Hi, I'm Jodie Wallis, Artificial Intelligence Lead for Accenture in Canada.

Amber: And I'm Amber Mac, and you're listening to The AI Effect, a podcast about the adoption of artificial intelligence in Canada.

So we start in Tallinn, Estonia. What does the future of AI look like for a government that has shown itself to be a savvy predictor of the technological future?

We spoke earlier with Siim Sikkut, the CIO, and yes, they have that title, of the Republic of Estonia. Here are some extracts from that conversation. Our first question, what's the secret?

Siim Sikkut: Long story short is that I think we were lucky enough that our governments realized that as digital technology was becoming a thing in late nineties, that perhaps this is a way for us to go because we as a small country, we tend to be very efficient and effective as a government and society. So they started really experimenting, and lots of experiments bore fruit, then it was made a conscious effort in the strategy. So if you ask, what's the secret to success? Willingness to try. And then if it works, then we just scale it and make it a daily and regular habitable thing.

Jodie: One of the biggest challenges for governments, and really any organization, is how you manage legacy costs and legacy ways of doing things. How has Estonia tackled that problem?

Siim Sikkut: Of course, when we are rebooting the whole country in the 90s, we had no big legacies to start with. My challenge has always been, that also to my colleagues and internally, but for our government here that look, if we see that something's not working anymore, if we see that there's a better alternative on the horizon, we have to be ready to make a change and kill the stuff we've been used to because otherwise,

we get stuck. And we have seen for many other governments, colleagues around us, that if you remain stuck, then you also end up spending more and so legacy is something you have to kill every now and then.

Jodie: So some great lessons from the CIO of Estonia. In particular, the idea which I think originated with Clay Christensen, that in order to innovate, it's really important to set up your digital platform services and systems on the side of your existing legacy infrastructures, and then start to move things ahead on that parallel platform.

Amber: And we spoke about this a little bit with Prime Minister Justin Trudeau, where we were talking about how important it is to experiment when it comes to artificial intelligence and try new things. So in many respects, it's almost as though you need to have these projects going on that are operating even though those legacy systems are still in place, and then you kill off the legacy systems. Although I think that's harder for us in Canada, being a bigger country.

Jodie: It's definitely harder, it's harder because we're bigger, because we have legacy and it just feels not to be really in our conservative nature.

So if you are starting off from scratch, or remaking your legacy processes, where do you start? Back in Canada, here's Kathryn Hume, Vice President at Integrate AI, a company that's trying to help a variety of clients use AI to solve their very real world problems.

We started off by asking Kathryn how she defines AI.

Kathryn Hume: I think of it as— it's whatever computers can't do until they can. So I like this as a definition because it bakes innovation into the definition itself. It's not all that meaningful, but it is, and it is because it helps us see that an algorithm like that powering Google Maps, which by now we don't really think of as AI, we think of it as like just plain old technology. It's pretty damn sophisticated, and uses a lot of data and a lot of machine learning behind the scenes and under the hood. And we think about self driving cars as the quintessence of artificial intelligence because it's just becoming possible. And we

think of things like brain machine interfaces and telemetry and telepathy as sort of science fiction still, but maybe sometime in the future, our measuring stick will have changed, and that will be what's considered AI.

Jodie: So at Integrate, you're really focused on working with large corporations, and you're focused on taking them sometimes from, let's say, unsophisticated technology capabilities to something that's really meaningful and can really push the boundaries forward. So tell us a little bit about the barriers to adoption that you see in corporations.

Kathryn Hume: Sure. So at the essence of algorithmic capabilities as data, and one of the sort of foundational challenges that all enterprises are going to face is the data and the quality of the data. They often have a lot of it, but that doesn't mean that it's ready at hand and useful for the algorithms. So there's sort of these multi-year processes that enterprises will go through to go from a bunch of siloed systems, so if we think about a metaphor, it would be like, we've got various countries that are in conflict with one another and don't speak the same languages, and they try to come to peace and it's like, you need a translator and nothing's working and you've got egos erupting left and right. That's kind of like what an enterprise siloed data system looks like, and there's this effort to make the Esperanto driven utopia of the future that is the enterprise data lake where all of the formats are reconciled, and we have this nice, clean, ready-at-hand trove of gold that we can mine. So that takes a really long time.

And one of the failure modes that enterprises face is they feel like they have to go sequentially, so that has to happen first, and they need the house to be perfectly in order in order to start to get some value from algorithms, and that it will just take too long. So there needs to be an acceptance of the mess and starting to get going with the algorithms in order to get started. On the flip side of that, I think from a cognitive perspective, or a managerial perspective, in the 20th century, we governed processes using OKRs, linear metrics, KPIs, etc. And basically, if we think about the CFO, the office of the CFO is sort of the control center within organizations. What mattered was

accuracy and certainty. So if we're going to be reporting on 10K reports and 10Q reports and understanding how the various business departments are doing, we really need to report on things certainly. AI is a probabilistic game.

These are statistics that make guesses, they have confidence rates, they have accuracy rates, and the types of management strategies that are required to really succeed with probabilistic systems are quite different from those that are required to succeed with, let's say, certainty based analytics systems. So I'd say those are two of the primary challenges that I see. And maybe the third would be risk management and fear of data privacy, fairness, alienation of consumers, doing something wrong, breakdowns, whatever it may be. And I think those risk issues are not too unique to artificial intelligence, but they're certainly coming to the fore when it comes to adoption.

Jodie: I just wanna expand on the second point you made, which really calls for culture change, and culture change generally starts from the top. So are you seeing executives move to make that culture change, to understand and embrace probabilistic and inaccurate, purposely inaccurate insight?

Kathryn Hume: I think there's different approaches to trying to accommodate a different kind of culture to support innovation that organizations can take. Sometimes it will be the, if the organization is structured in such a way that there can really be like the command and control, CEO makes a decision and it gets pushed all the way down, I've seen that happen. Actually, there was a big international bank that I've worked with where they decided CEO-level C-level that this is changing and there was momentum then to push through sort of a holistic cultural change across the organization.

Most of the time per the lessons that we've sort of all learned from Clayton Christensen, there'll be a new business unit that is generated that is the innovation group that has the prerogative of doing things differently than the rest of the organization. I think that that's probably the best

way to go and yet, there's ways to do that well and ways to do that poorly so I've seen a lot of enterprises struggle when they nominate sort of the innovation group but they're not really empowered. They become the guardians, the control function to vet start ups and find the right business opportunities, but if they're not tightly integrated with the business units, they have a trouble recognizing decent opportunities. They have trouble aligning start ups and vendors with the right business units and everybody just kind of gets frustrated.

But when the innovation group is tightly integrated with the business units, I think there's sort of a magic that can happen.

Jodie: One of the biggest concerns for adoption is people feeling their roles are threatened by a new way of doing things.

Kathryn Hume: I tend to be an optimist as it relates to job change. I think it can help get rid of work that we don't actually like doing and there's fear associated with that because there's a lot of work we don't like doing but that keeps us alive and provides structure. I believe we need structure to be happy as human beings. We're social and we like to work together to achieve concrete goals but we also have limited imaginations. We don't know what might arise if we were to get rid of a lot of the work we're doing today.

Jodie: You're touching on a point that is talked about a lot in the media. As a matter of fact, I think it's the point that's talked about most in the media, which is there's going to be an impact on jobs. I think there's a lack of consensus as to what that impact will be. Which jobs will completely change versus just marginally change. What's your view on how AI is impacting jobs for this generation and also for the next generation?

Kathryn Hume: I was at an event a couple years back and some folks from the Rand Corporation put up a quadrant related to the types of work we do as people. The axis of the plane, of the quadrant were the time with which we have to do

the job, so is this something that requires like immediate judgment or is this something where eh, if it gets done next week we're okay? You got that sort of time delay. And then the other axis of it was is it something you do over and over again? Is there structure or is it like improvisation? Is this classical music written by Bach or is this jazz by John Coltrane? Right?

Using those as our criteria for judgment. Timeline to respond and then variation of response. That was sort of their map in terms of the things that are likely to be automated and the things that won't. If we look at the things that could be automated, there are things like maybe filling out tax tasks, accounting, some legal work, it's not going to vary a ton situation by situation and often that's not something we need to have a judgment call right in the moment.

If we go out to, and this is where we sort of topple some of the class structure in society to lots of blue collar jobs that actually have a lot of improvisational judgment calls in them so driving a truck, there's lots of incoming stuff all the time and you have to make quick decisions on the fly in order to drive safely. That's why autonomous vehicles are actually super, super hard so we say, "Wait, but I thought truck drivers are those that are going to be automated soon," but I actually think that a lot of manual blue collar work is super hard for artificial intelligence to replicate so I think that what's interesting right now is that the tasks, the sub-tasks in certain jobs that are most amenable to automation using artificial intelligence are those that are more on the white collar stack than those that are on the blue collar stack.

Jodie: But are we creating jobs too? You talked about a translator rule earlier. Are we creating jobs here?

Kathryn Hume: We always are creating jobs, yeah. I mean I think if we were even to look to the last generation of like web technologies. At my company right now, at Integrate, we hired a project manager recently, we hired a front-end designer that has experience in representing the

output of algorithms in friendly terms for people. We've been hiring basically business development representatives who can work with our clients and walk them through machine learning projects. These are variations on themes, but they're jobs that really didn't exist a couple years back.

The job that I occupy I don't think existed a couple of years back and this is a narrow subset right, one artificial intelligence start up but I think across the board, there's new types of jobs. The challenge we face is to have our educational system move fast enough to help us re-skill, retrain so that we as people have the requisite skills to do this work and I'm an American who moved to Canada about a year and a half ago and it's heartbreaking for me to see so many open positions in the United States that stay open because there's the mismatch between the supply of talent and the demand for talent.

Jodie: There seems to be a divide between what executives are saying the impact of AI will be on jobs and the way employees are feeling. Ina a recent study that was done by SASS, Intel, Forbes and Accenture, only 9% of executives in this survey and it was a global survey, said they anticipated an impact on jobs due to AI's implementation but that's not what we hear in the media and I don't think that would be the same perspective that employees would have.

Amber: I think you're absolutely right. I think it just really depends who you ask. So for example, if you go into industries like call centres or ask truck drivers there will be many different answers. Many of them will be nervous that AI potentially will not only change their job but could eliminate their job so at the end of the day, it's really just a point of view and the industry that you're in.

Jodie: Let's continue talking about adoption. Here's Valérie Pisano. She's the president and CEO of MILA in Montreal. It's a lab founded by one of Canada's best known researchers in the space, Yoshua Bengio and one of its mandates is to help take new AI technology to small and

medium size enterprises for adoption. Valérie, thanks for joining us. Can you give us a couple of examples of the things you're working on?

Valérie: Sure, I'll give you two. One is a start up based here in Montreal called Imagia. And with Imagia, we've developed a solution that allows us to identify cancerous cells in medical images. A, it's pretty interesting to know that AI is already being used for this kind of application and of course it can lead to people living much healthier lives. but what's interesting in this case, if we want to connect the two polls at the mission, is that it's actually very close to being commercialized. So Imagia just signed a contract with one of the largest distributors in the world. So it's not just that we've created the solution so that the science exists, it's actually that it's very, very close to reaching actually patients in actual clinics and actual hospitals.

Another example of that is a small enterprise on the south shore of Montreal here that owns the solution through which patients can book an appointment with a doctor in a number of clinics. 300 clinics are part of this solution and so we advise them over the course of 20 to 30 weeks, I think, on how to use AI to make the solution even more efficient.

What that means tactically is if you go to the portal and you book an appointment for your daughter for example for tomorrow at 11, what the system now does using AI is that the morning of your appointment, it'll filter through thousands of different factors and variables and it'll text you two hours before your appointment. To say, "You know what, today the doctor actually won't see you at 11. We think it's going to be more around like 11:30 and so don't show up for 11, you're just going to be wasting your time in the waiting room."

They've actually reduced the waiting times to 20 minutes or less. It's something like millions of hours we could save collectively and so these are very, very tangible, concrete applications that have impact in everyday lives that we've been a part of.

Amber: Moving to Toronto at the Vector Institute, Cameron Schuler does similar work to Valérie Pisano. Helping companies deploy AI from the lab to the real world. We asked Cameron where are the biggest AI opportunities?

Cameron: Ah, that's a good question. So, if I take a look at the opportunities for AI, the easiest way for me to think about it, we'll call it an algorithm because then it makes me feel smart but it's anywhere you use data to do forecasting, anywhere you use data to make decisions, and anything that's automated. Those are really good examples of how you can deploy AI, and I mean broad AI so not just deep learning or you know reinforcement learning but something a little bit more broader.

I think the areas where it's really going to make a difference is when you think about big data sets, being able to work with those I think the methodologies we have for how we change people's lives, those are going to grow pretty dramatically. I take a look at— would I really want a doctor spending an hour interpreting my diagnostic imaging or if I'm having a health problem, would I prefer they don't spend much time but they spend more time with me? So I think AI will make us much more people-centric and I think it has to be.

I could certainly see it in the energy space. Oil and gas is not going away but it's way more time bound now than it was before. Finance for me always has been something of interest, just because it's lots of data, so any place you have lots of data that you can work with somewhat easily, is important.

I'm way more optimistic about the future.

Jodie: You said just now Cameron, that AI will make us more human-centric. A lot of people are saying that AI is going to have negative impacts on humanity, that we'll forget about talking to one another and making decisions using the part of our brain that allows us to solve problems to make decisions. What do you say to that?

Cameron: I think the best examples of AI are ones that actually incorporate humans, the human in the loop. If we take, I mean we're always afraid of technology. I have quotes from the 1800s of how technology is taking our jobs. I think there's a natural fear of technology because that's how we've survived as humans. Texting is not AI, and it's really taken us out of human-to-human communication. If we look at— we still have the monkey brain and reptilian brain, right? We still function well on a one-to-one basis. There was a meme going around so of course those must be true, but it was from— people on the street car reading newspapers, because newspapers are evil. People aren't communicating, they just have their face in their paper.

If you have a kid that likes to read, that walks around with a book and sticks it on the table and won't talk to you— like everything it's a double edge sword.

Amber: It's interesting when you talk about that fear because I think in some ways, artificial intelligence has a bad reputation, particularly when you look at headlines in the media where they talk about AI and the context of robots coming to kill us all. I'm just curious, in your experience, if you feel as though something more needs to be done to educate the public in Canada and beyond about artificial intelligence?

Cameron: Freaking John McCarthy, who coined the term artificial intelligence, so that's part of the problem, right? It's a vision that engenders some sort of humanoid form when, in reality, a lot of the artificial intelligence we deal with is not anywhere near like that.

The education thing is always hard, think about anti-vaccers. In the United States alone, the highest percentage of anti-vaccers live in the most educated county in the United States. So I think there certainly needs to be a delineation between what AI is and what technology is, so I have somewhere on one of my computers I have a— it's either a manual or a very detailed brochure on Apache Helicopters, which are a battlefield helicopter. And they've been able to

probably for 10 years talk to each other, acquire targets and kill people, something like a 170 in three second. It's not a learning system, it's an engineered system right? So this AI component, the concept of something sentient that would be able to destroy us. Think about what we do as humans pretty regularly is we create models of ourselves, which are children. Do I worry about my children coming and killing me? I don't, right? This is something that, every generation we seem to be getting better at this sort of thing.

So, if you take a look at history, I mean you go back to the era of World War I. So 100 year ago. Society was pretty enlightened and it really devolved pretty quickly, and it really had nothing to do— I mean it was a war of technology, but it wasn't necessarily driven by that. I'm always amazed how he can go back to the dark ages and really short periods of time. So anyway, I don't see that with AI. I don't see that as a risk. I think anyone that is telling these stories of killer robots, I don't really believe understands what AI is.

So we certainly have as Vector Institute, a number of people affiliated with this. There's a online petition about the weaponization of AI. We do have a position on that and we don't want to see it. But think about how successful we've been with legislation. Go back to prohibition, did that work well? The war on drugs is something that's completely failed. Not that I'm suggesting people should do that, but the reality is legislation— you can't legislate morality, right? And so there's a component of it is, you can stick very close to what we— your beliefs, which I think is a great thing. But there will be people out there that don't. And so there's— it's a really a much broader question. But I think if we don't lead the— lead the dialogue on the ethics of AI, the transparency of AI —we talk about it as people with pitch forks and torches showing up. So, we do worry about that.

Jodie: So this is a topic that we have heard from a number of our guests time and time again. It's the point that we really need to be having open and deliberate conversations about the unintended consequences of AI and the potential risks.

Amber: Absolutely we've heard about this from Prime Minister Justin Trudeau. We'll also hear about this later on in the series from Shopify in terms of a Code of Conduct, and many people are thinking about the ethical applications of artificial intelligence. I guess the question really is, who is responsible?

Jodie: And because that hasn't been defined, there are many, many players that are stepping up to lead the conversation.

Last year in Montreal in November of 2017, there was a conference called The Forum on Socially Responsible Development of AI, and as part of that conference the team there led by the University of Montreal developed the Montreal Declaration for Responsible Development of Artificial Intelligence, and this declaration aims to spark public debate, and encourage a progressive and inclusive orientation to the development of AI.

Amber: Here's Joelle Pineau. She's on the faculty of McGill and also running the Facebook AI Research Lab in Montreal.

Jodie: So last November in Montreal there was a conference that led to the Declaration of Responsible AI, the Montreal Declaration for Responsible AI. What's your point of view on the role that you and this lab play on the development of responsible AI?

Joelle: I think many of the researchers are really paying close attention at what is our social responsibility in developing that technology? And in doing so, that means that whenever we design your projects, pick new targets for our research, that gets influenced by that. And so there's one aspect that is really how do we integrate these considerations in the development of our research projects, our research agenda. So for example, a few months ago I had a team of students come to me, they're experts in developing what we call dialogue systems. And they wanted to write a paper about what are some of the social and ethical issues that arise when you're training dialogue systems. So that was really from the research side. Now, in parallel with this I think as scientists but also

citizens more and more we've been engaging in discussions with people from other fields, whether it's philosophers, ethicists, legal scholars, into what are some of the broader implications of our technology and that discussion is just starting. The Montreal Declaration was one artifact of some of these discussions. I think we have some ways to go as we develop that further.

Jodie: And so when you talk about ethical algorithms, you've talked before about ethical algorithms, what does that mean, and how does that factor into the research you're doing?

Joelle: In many cases, just defining what we mean by this is part of the scientific development. So we can talk about fairness in algorithms, as a scientist I need almost a mathematical definition of what fairness is going to mean. And so that means I have to articulate a criteria that the machine can measure. And there's different notions of what fairness may be, and depending on different perspectives people have used different definitions of this. So one definition that is perhaps used is if you identify subgroup of your population, the classification accuracy for the subgroups in your population should be the same. So you shouldn't be much more accurate in classifying the tweets coming from the members of one community, versus members of another community. That's one definition, by no means the only one.

Amber: You talk a lot about enabling machines to make good decisions in a complex world, how can we achieve this?

Joelle: It's a broad question, it's one I've been working on for 20 years and I hope many more years to come. A few elements, I think one of them is building models that can represent the full richness and complexity of the world. And so, that means that there's information that is captured by the machine, but the machine also has a notion of how uncertain it is about the information. Not everything is true or false, black or white. There's a notion of what the machine knows, and there's a notion of what the machine might not know, and what could happen. And so by building— and usually this is integrated in our

machines through the tools of probability theory. So by incorporating probabilistic model, we are suddenly able to represent uncertainty, we are able to build decisions that are robust to that uncertainty, build algorithms that can seek more information to compliment the information that they have. And so to adequately represent all of that richness, but that's a big challenge. How to do that for many different types of machines, many different types of data, many different types of decisions.

Amber: Thinking about all of the people that we've talked to for this episode, there is this quote that is top of mind for me from Graham Wood, and he says, "Change has never happened this fast before, and it will never be this slow again." And I think about that when we think about the future of AI, it's still early days, but we are still hurling forward at an incredible pace.

Jodie: And Joelle asks a pretty big and philosophical question in her discussion, which is, how will machines ever handle the complexities and uncertainties of our world? What we're learning, what we've learned throughout this episode, though, is that adoption is fundamentally a human issue, it is not a technological issue, it is not a research issue, it is a human issue.

Amber: And for the rest of this podcast series we're going to drill down industry by industry to look at how AI is changing the way we run our enterprises, and the jobs we perform.

Jodie: In this episode though, we're going to give the last word to Elissa Strome, she's the executive director of the Pan-Canadian AI Strategy at CIFAR, the Canadian Institute for Advanced Research, because possibly the best way to think about AI is in terms of the opportunities it creates for all of us.

Amber: When you look at the research programs that you have right now, what problem do you think we're closest to answering?

Elissa: Wow, that's a doozy, that's a doozy of a question. You know, it's really hard to say. When I think about where I'm most excited about the application and adoption of AI, one of the areas for sure is transportation. And I think we're really, really close on self driving cars. We have a lot of work to do around safety, security, privacy, regulation, all of those things. I'm not saying it's going to be easy, but I think we're really, really close on that front. And I also think that in addition to health care, with transportation we have a great opportunity to have a really positive social and environmental impact, right? And so, I think that if we can start adopting AI more quickly within the realm of transportation, that's going to be an area that's going to make a difference very soon.

Jodie: As a neuroscientist, you bring a very interesting perspective to AI.

Elissa: I think especially in Canada, I think there's a tremendous opportunity for AI to help advance healthcare. As a neuroscientist, but also as a citizen, as a mother, I see that we have so many opportunities in Canada's healthcare system to adopt technology in order to improve diagnosis, develop new treatments, enjoy cost savings within the system, and provide more efficient and effective treatment. And so, all of those are really noble and lofty goals, and the devil is always in the details.

Amber: The devil is in the details, and we hope you can join us for our entire series where we did into agriculture, insurance, health, customer service, and smart cities. All industries and domains being reshaped right now by artificial intelligence.

Jodie: I'm Jodie Wallis.

Amber: And I'm Amber Mac. You can find out more about the topics we've covered in this series by going to our website, theaffect.ai, or accenture.com.

Jodie: And if you like us, please tell your friends, and rate us on your podcast app.

Amber: The AI Effect is produced by Stuart Coxe and Annalise Nielsen at eOne Podcasting, with support from Accenture.

Jodie: Music is by Colin Richards.

Amber: The supervising producer is Norma Mendoza from eOne.

Jodie: Our associate producer is Kimberly Hacuman.

Amber: And a special thanks to all of our guests who joined us from the public and private sectors all over the world.

Jodie: Thanks for listening.