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Quantum's Unexpected Early Adopters

The Second Curve of Expertise

Keynote Companion Document

Slides paired with speaker remarks

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About this presentation

This document is a companion to the keynote Quantum's Unexpected Early Adopters: The Second Curve of Expertise, delivered at the High Level Conference in Lethbridge, Alberta in May 2026.

The keynote argues that the people best positioned to identify meaningful quantum computing use cases inside an organization are not the early-career technical specialists most quantum adoption strategies assume. They are the experienced professionals, the operators, engineers, and senior practitioners, whose accumulated system knowledge allows them to recognize which complex problems are structured in a way that quantum approaches can address. The argument is grounded in Arthur Brooks' research on the second curve of professional contribution, the cognitive science of fluid and crystallized intelligence developed by Raymond Cattell and John Horn, and David Galenson and Bruce Weinberg's work on conceptual and experimental innovation life cycles.

SLIDE 1

Quantum's Unexpected Early Adopters



Picture the person in your organization who is most likely to spot a transformative use case for new technologies. Picture them clearly. Their age, their role, their background, the kind of language they use when they describe their work.

The title of this session is Quantum's Unexpected Early Adopters, and the word that matters most in that title is unexpected. The argument I want to put in front of you over the next half hour is that the person you just pictured is probably not the person who will actually do that work. And the reason is not what you might think.

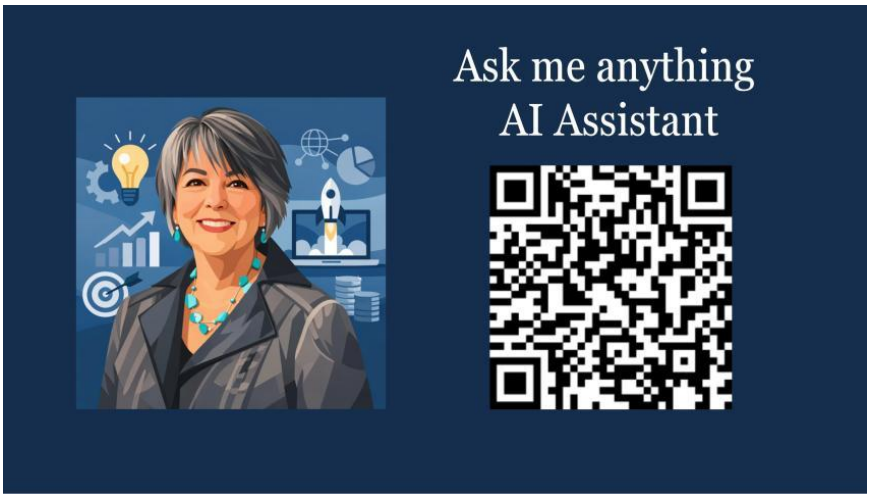
It is not about technical fluency. It is not about generational fit. It is about a specific kind of expertise that takes time to build, and that we have, as a field, consistently undervalued in technology adoption conversations.

I am Renae Barlow, Principal at Summit Stream. I have spent over twenty years working at the intersection of innovation infrastructure, executive leadership, and emerging technology adoption, including time leading global ecosystems for a quantum computing company. What I am bringing you today is a pattern I have seen repeatedly across that work, framed by research from three sources I will introduce shortly.

Let us take a closer look.

SLIDE 2

Ask Me Anything — AI Assistant



Speaker remarks

Before I move into the substance, one practical note.

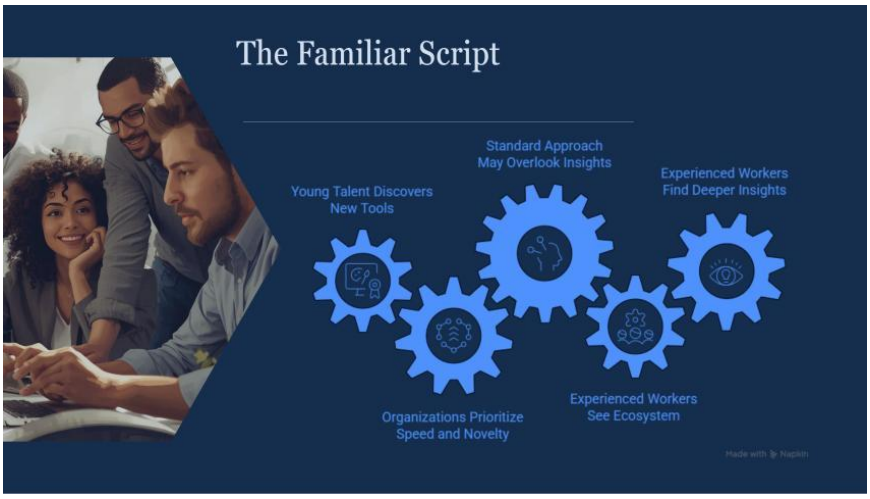
I have built a small AI assistant trained on the material behind this keynote. If you have questions during the session that you do not want to interrupt for, or questions that come up later in the week as you sit with this, you can use it. The QR link is on this slide, and it will be in the materials shared after.

It is not a substitute for direct conversation, and you will see that I have set it up to point you to my contact information if you want to go deeper. But it is a way to engage with this thinking on your own time. Use it if it is useful.

Now, to the argument.

SLIDE 3

The Familiar Script



Here is the script most of us have internalized about how new technologies enter organizations.

Younger talent moves first. They are closer to the leading edge. They are not weighted down by the way things have always been done. They experiment. They iterate. They are willing to look foolish in the service of figuring something out, and that willingness opens the door for everyone else.

This script is not wrong. For many technologies, it has been accurate. The early days of cloud computing followed this pattern. So did mobile, in many organizations. So did, for a stretch, machine learning.

And so, when quantum computing enters the conversation, it is natural to assume the same pattern will hold. Find the technically curious early-career professionals. Get them learning the platforms. Let them surface the use cases. Let them lead.

What is becoming clear is that quantum computing does not behave the way previous technologies did at the adoption stage. The bottleneck is in a different place. And once you see where the bottleneck actually sits, you start to see why the familiar script may not be the right script for this particular technology.

That is what I want to walk you through.

SLIDE 4

A Different Lens — Arthur Brooks and the Second Curve



In his book From Strength to Strength, the social scientist Arthur Brooks describes two curves of professional contribution.

The first curve is marked by speed, novelty, and raw analytical horsepower. People on the first curve excel at acquiring new information quickly, recognizing patterns in unfamiliar data, and producing original work in domains where the rules are still being written. This is what most cultures romanticize when they talk about innovation.

The second curve is different. It is marked by judgment, synthesis, and the kind of pattern recognition that only develops with sustained engagement in a domain. People on the second curve are not slower thinkers. They are different thinkers. They have accumulated enough context to know which variables in a complex situation actually matter, and which ones look important but are not.

Brooks' point, and the point I want to draw out for our purposes today, is that the transition between these curves is not a decline. It is a reorientation. The professional moving onto the second curve is not losing capability. They are exercising a different capability, one that takes a long time to develop and that most organizations do not know how to recognize.

In practice, this matters for quantum adoption because the limiting factor in quantum adoption is not speed. It is not novelty. It is judgment about which problems in your organization are actually structured in a way that makes them candidates for quantum approaches. That is a second-curve question.

SLIDE 5

Fluid versus Crystallized Intelligence



The Brooks framework rests on cognitive science that goes back further than most people realize.

In 1963, Raymond Cattell published a theoretical distinction that John Horn later developed empirically: fluid intelligence and crystallized intelligence. They are not competing categories. Most of us draw on both, every day, in different proportions.

Fluid intelligence is the ability to reason in unfamiliar territory, identify patterns in new information, and solve problems where you cannot lean on prior experience. It tends to peak in the late twenties to early thirties and gradually declines after that.

Crystallized intelligence is the ability to apply accumulated knowledge, judgment, and pattern recognition to recognize what is happening in a complex situation. It does not peak early. It continues to develop into the sixties and seventies, sometimes longer, in people who remain actively engaged in their domains.

From a systems perspective, this is significant. The work of identifying a quantum-relevant problem inside a real organization is not primarily a fluid-intelligence task. It is a crystallized-intelligence task. It requires recognizing that what looks on the surface like a routing problem is actually a synchronization problem, or that what looks like a prediction problem is actually a constraint management problem. That kind of recognition does not come from learning quickly. It comes from having seen enough variations of the system to know what is and is not the real issue.

This is where focus is required. The cognitive profile that quantum problem identification asks for is the profile that develops with experience, not the one that peaks earliest.

SLIDE 6

Problem-Framing Challenge



Here is the practical translation of all of this.

Most conversations about quantum readiness are organized around a technical question. Do we have the skills? Do we have access to the platforms? Have we partnered with the right vendors? These are not the wrong questions. They are just not the first question.

The first question is strategic. Which of the problems in your organization are actually structured in a way that quantum or hybrid quantum approaches can address? Which of them have the kind of mathematical character, large numbers of interacting variables, exponential solution spaces, competing constraints, that would benefit from a fundamentally different computational approach?

If you cannot answer that question, the technical investment does not matter. You will end up applying powerful tools to problems that classical computing already handles well. Or worse, you will not apply them at all, because no one in your organization will have framed a problem in a way that makes the case obvious.

At the core of this work is a translation. You are translating from how a problem is currently described inside your organization, in operational language, in financial language, in customer language, into the language of computational structure. That translation is hard. And it is hard for a specific reason. The people who understand the operational reality of the problem usually do not speak the language of computational structure. And the people who speak the language of computational structure usually do not understand the operational reality.

This is the real bottleneck. It is not skill. It is translation.

SLIDE 7

Understanding Complex Problems



Before I get to the examples, I want to offer a distinction that is worth carrying with you, even outside of quantum.

There is a difference between a complicated problem and a complex problem.

A complicated problem is one that has many moving parts, but the parts behave predictably. Once you understand the components and the rules, you can solve it. Building an aircraft is complicated. The engineering is hard, but the physics is consistent.

A complex problem is structurally different. The parts interact with each other in ways that change the behaviour of the system as a whole. Optimizing one variable shifts another. Conditions are not stable across time. There are competing constraints that cannot all be satisfied simultaneously, only balanced.

Complex problems do not sit inside one department. They span functions. They involve incomplete data. They require judgment about which variables actually matter and which ones are noise. And the people who are best at navigating them are usually the people who have lived with them for years.

This is the kind of problem that quantum approaches are well suited to address, not all complex problems, but a specific subset that has combinatorial structure. And the people best positioned to identify which of your complex problems have that structure are the people who already understand the system well enough to see how it actually behaves under pressure.

SLIDE 8

In Practice — The Logistics Network



Let me ground this in a real example.

Picture a regional distribution network. Dozens of locations. A mix of urban, semi-urban, and rural delivery points. The kind of operation where weather affects everything, where shift regulations shape what is possible, where seasonal demand patterns swing in ways that the systems were never quite designed for.

The technical team has been trying to improve overall network performance for some time. They have brought in better routing software. They have run simulations. They have tightened up vehicle utilization. Each effort produces a small lift, but the system as a whole never seems to stabilize.

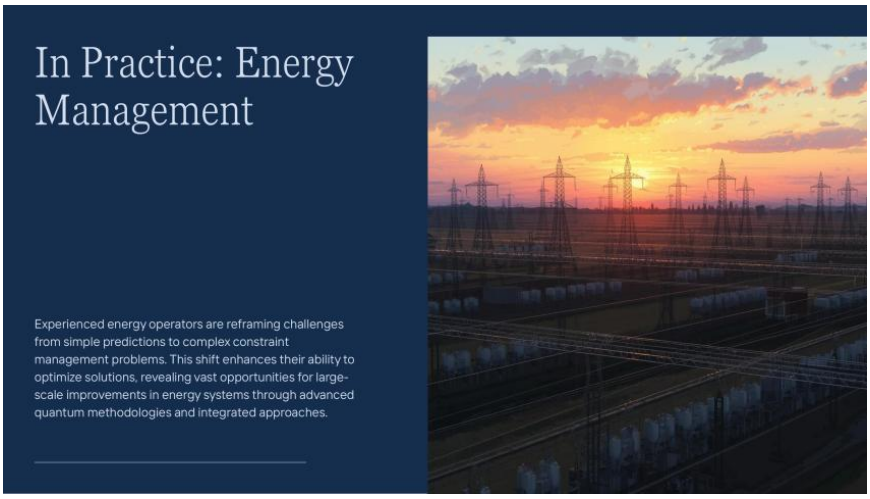
The shift happened when a senior operations leader, someone who had been moving freight for thirty years, looked at the work and said, in effect, you are solving the wrong problem. This is not a routing problem. It is a synchronization problem.

That reframe was decisive. Routing assumes you are finding the best path between known points under known conditions. Synchronization is different. It is about coordinating delivery windows, driver shift regulations, equipment availability, weather variability, and seasonal demand fluctuations all at once, and recognizing that improvement in any one of them changes the constraints on all the others.

Once the problem was framed that way, something else became visible. Synchronization across competing constraints, at the scale of a real distribution network, is a combinatorial optimization problem. The solution space grows exponentially as you add locations and variables. That is exactly the kind of mathematical structure where hybrid quantum approaches show the most promise today.

SLIDE 9

In Practice — Energy Management



The same pattern shows up in energy.

An energy operator is scheduling generation across multiple sources. Renewables with variable output. Thermal generation with maintenance schedules. Transmission constraints. Demand that fluctuates by hour and by season. Storage capacity that buys some flexibility but not unlimited flexibility.

The technical team has invested heavily in better prediction. Better demand models. Better generation forecasts. Better weather inputs. Each improvement is real, and each one helps.

And then a senior engineer steps back and says, prediction is not the bottleneck. Constraint management is.

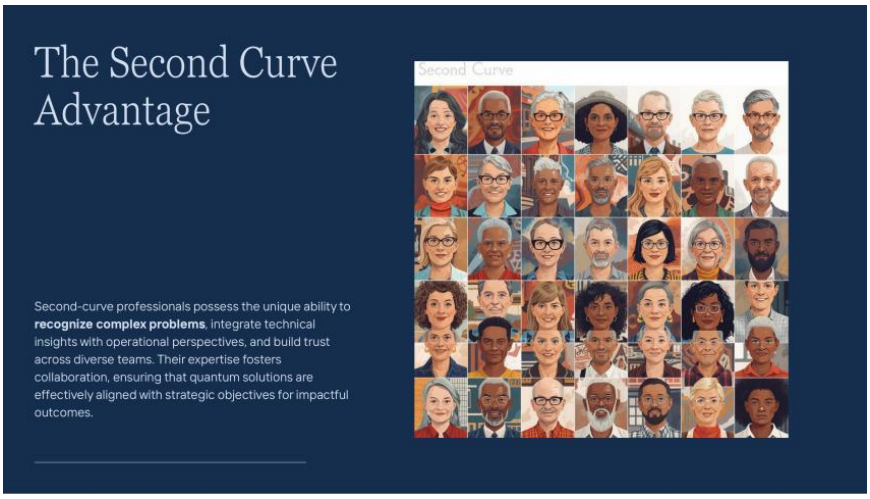
That is a different kind of problem. Prediction is about reducing uncertainty. Constraint management is about navigating a system where the variables are interdependent, where optimizing any single one creates new constraints elsewhere, and where the operating envelope shifts continuously.

Once you frame it as constraint management at scale, the same shape appears that we saw in logistics. A large optimization problem with combinatorial structure. The kind of structure that quantum methods are being developed for.

In both of these cases, the unlock came from someone who knew the system intimately enough to recognize that the technical team was solving the wrong problem with great precision. That recognition is the second curve in action.

SLIDE 10

The Second Curve Advantage



Let me name what second-curve professionals are actually doing in these examples, because I think it is worth being precise.

First, they recognize when a problem is genuinely complex. They have seen enough variations of their system to know when something has cross-functional structure, competing constraints, and interdependence, the markers of a problem that classical approaches will struggle with at scale.

Second, they can integrate technical and operational perspectives. They are not technical specialists, but they have worked alongside technical teams long enough to translate between operational reality and technical possibility. They are bilingual in a way that most early-career professionals are not yet, and most senior technical specialists may never be.

Third, and this one is often underestimated, they build trust across teams that need to work together for adoption to succeed. Quantum readiness is a multi-year, cross-functional commitment. The people who can convene operations, technology, finance, and leadership in a working conversation are the people who have built credibility across those functions over time.

Together, this is a strategic capability set. It is not nostalgic. It is not about preserving experienced people for sentimental reasons. It is about deploying a specific set of capabilities at a specific stage of a specific kind of technology adoption.

SLIDE 11

Multigenerational Insights



I want to be very clear about what I am not saying.

I am not saying that early-career professionals are the wrong people for quantum work. They are essential. They bring technical fluency with the platforms and tools, experimental energy, willingness to engage with rapid iteration, and proximity to the academic research that is moving the field forward. None of that is replaceable, and none of it is what second-curve professionals provide.

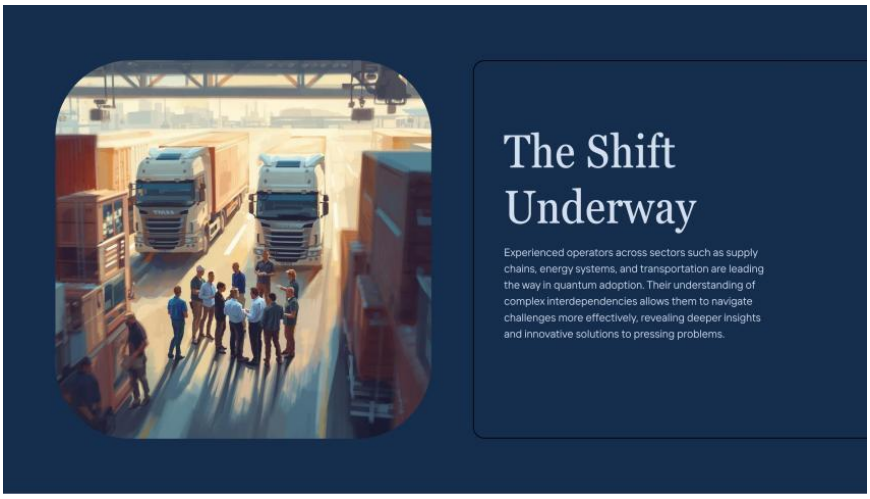
What I am saying is that the conversation about who leads quantum adoption has been treated as a single-cohort question. And it does not need to be.

The organizations making the most progress on responsible adoption of emerging technologies are not betting on one generation. They are designing for multigenerational engagement on purpose. They are bringing experienced operators into early problem-framing conversations, not waiting until implementation. They are pairing senior domain expertise with early-career technical capacity, not running them on separate tracks. They are creating shared language between the two so that translation can happen continuously, not just at the handoff.

This is what I mean by structuring for impact. The structure of the team determines what the team can see. A team built around one cohort sees what that cohort sees. A team built across cohorts sees more.

SLIDE 12

The Shift Underway



This is not a hypothesis I am asking you to take on faith. It is a pattern that is already showing up in the sectors most likely to see early quantum adoption.

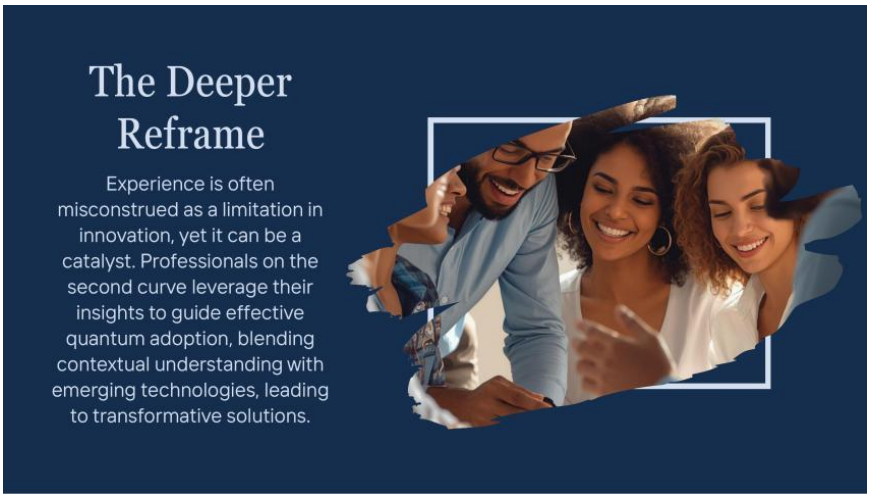
In supply chains, the people surfacing quantum-relevant problems are seasoned logistics and operations leaders, not the data science teams working alongside them. In energy, the reframes are coming from grid engineers and power systems veterans. In manufacturing, it is the senior process engineers. In transportation, it is the people who have been working with constraint-heavy operational environments for decades.

In each of these cases, what is becoming clear is that the experienced operator is not waiting for the technology to mature before engaging with it. They are engaging now, by reframing problems they already understand intimately, in ways that make the technical case answerable.

That is the shift underway. It is not loud. It is not always recognized when it happens. But it is happening, and it is happening in exactly the places where you would expect responsible technology adoption to begin: in domains where the cost of mis-framing the problem is too high to leave to anyone but the people who know the system best.

SLIDE 13

The Deeper Reframe



There is one more piece of research I want to bring in, because I think it gives us a deeper reframe than the one we have been working with so far.

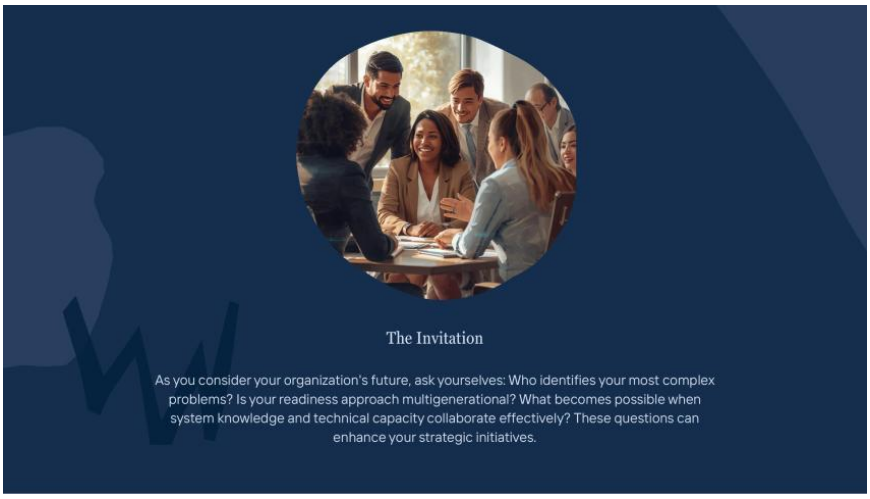
The economists David Galenson and Bruce Weinberg studied the careers of Nobel laureate economists. They were trying to answer a specific question. When in their lives do significant innovators do their most important work?

What they found is that innovators fall into two distinct life cycles. Conceptual innovators arrive with a new framework relatively early in their careers, sometimes in their twenties, often in their thirties. Their contribution is theoretical, fast, and disruptive. Experimental innovators work differently. They accumulate knowledge through extensive trial, refinement, and observation. Their most important contributions tend to come in their mid-fifties or later. Both kinds of innovation matter. But our cultural narrative about innovation has, for a long time, romanticized the conceptual life cycle and quietly dismissed the experimental one. We tell stories about the young genius. We do not tell as many stories about the senior practitioner whose forty years of accumulated pattern recognition produces the insight that changes the field.

From a systems perspective, what does this mean for quantum adoption? Quantum is not a conceptual innovation challenge. It does not require arriving with a new framework that did not exist before. It is an experimental innovation challenge. It requires accumulating system knowledge, identifying patterns over time, and synthesizing that knowledge into a reframe of a familiar problem. And experimental innovators are, on average, in the second half of their careers.This is the deeper reframe. Experience is not the cost of innovation in this domain. It is one of the conditions that allows innovation to succeed.

SLIDE 14

The Invitation



I want to close with three questions. I am offering them not as a checklist, but as questions worth taking back to your organization and sitting with.

First. Who in your organization sees your most complex problems? Not the loudest. Not the most senior. Not the most technical. Who actually sees them? Who has been close enough to the operational reality long enough to recognize where the genuine complexity lives, as opposed to where the noise lives? If you can name that person or those people, you already know who should be in your earliest quantum readiness conversations.

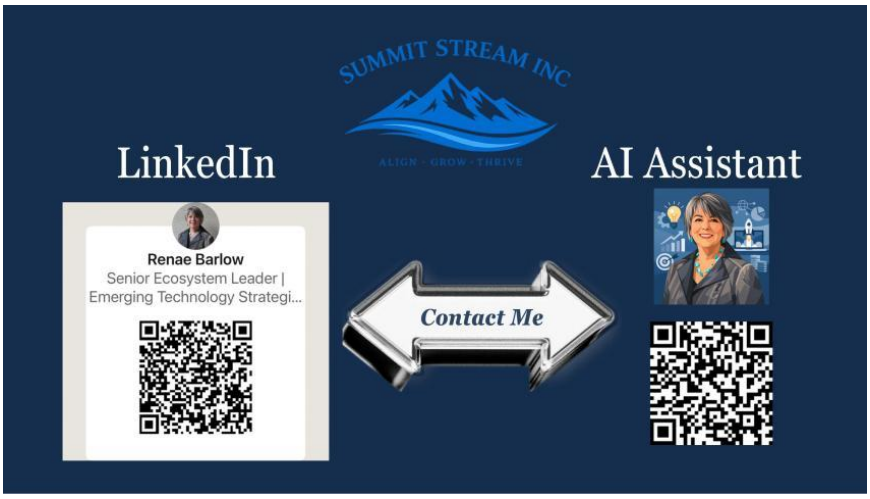
Second. Is your readiness approach multigenerational by design, or by accident? If you map the people currently shaping your organization's thinking on emerging technology adoption, what cohort are they drawn from? If the answer is one cohort, you are leaving capability on the table. The work is not to replace anyone. The work is to build deliberate combinations.

Third. What becomes possible when system knowledge and technical capacity are designed to work together from the beginning, rather than handed off in sequence? This is the question that, in my experience, most organizations have not yet asked. The answer changes how you structure teams, how you design problem-framing conversations, and how you allocate time in the early stages of adoption, the stages that determine whether the whole investment lands well.

These are not questions with easy answers. They are questions that reveal where focus is required.

SLIDE 15

Contact — LinkedIn and AI Assistant



If anything in this conversation lands for you, or if you find yourself working through one of those three questions in the weeks ahead, I would value hearing how it goes. You can reach me on LinkedIn, and the AI assistant is available for anything you want to think through virtually.

About the presenter

Renae Barlow

Principal, Summit Stream

Renae Barlow is the Principal of Summit Stream, an advisory practice focused on innovation infrastructure, ecosystem development, and the human and systems conditions that allow emerging technology adoption to succeed. She has spent over twenty years working at the intersection of leadership, economic development, and emerging technology, including executive roles as Vice President of Global Ecosystems at SuperQ Quantum and Vice President of Entrepreneurship and Innovation at Economic Development Lethbridge. Her work has included the development of Tecconnect, the Regional Innovation Network of Southern Alberta (RINSA), Women Entrepreneurs in STEM, Rural Women in Technology, and ElevateIP Alberta. She is a certified executive coach and a Certified Master Facilitator in Business Model Canvas and Value Proposition Design, with additional training in Leader as Coach, Agile Leadership, emotional intelligence, and conflict resolution. She has been recognized as a Woman of Distinction and as a Canada's Most Powerful Women Top 100 nominee.

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