

ISB CTO

Week 1: Role of CTO: Introduction

Video 1: Module Overview

Hello, welcome to our module on the Chief Technology Officer. You might wonder what's so special and unique about the chief technology officer. It is a role that is increasingly growing in prominence, especially in today's digital economy where every company is now a tech company. One of the challenges that companies are facing is, in an environment of volatility, uncertainty, complexity and ambiguity, the intensity of competition is growing, not just from their traditional rivals, but also from new rivals. In the tech sector, we call them the digital giants. Companies such as Facebook, Amazon, Apple, Google, which are using their knowledge and their capabilities with technology to disrupt every known industry, whether it be finance, healthcare, education and so on. At the same time, there are a lot of tech entrepreneurs. So, as a result, the due battlefield of competition and innovation is in the space where incumbent companies, digital giants and tech entrepreneurs, are all trying to figure out how technology can be the platform for innovation and competitive advantage. So, when everything becomes technology, there is need for leadership. Leadership that can supplement the existing capabilities of the CEO as well as the other existing senior business executives. So, today, when technology strategy is tightly intertwined with business strategy, how should firms respond?

To offer you a quote from Dr. Mark Maybury, who is the chief technology officer of Stanley Black & Decker. He notes that, for the first time in our species, technology can help us solving most of the challenges and problems, not just for corporations but also for society. And so, how do you respond? So, regardless of firms; small firms, large firms, everybody has a similar anxiety. What new roles should we create in order to help us improve our ability to succeed in this new world? And that's where the role of a chief technology officer becomes very important. As an example, a survey done by Deloitte and Wall Street Journal finds that, 93% of CEOs assert that technology is the key to driving competitive advantage and innovation. 84% of all the CEOs say that mastering technology is a critical challenge and the key to their success. And about half of them say that technology is going to become the key differentiator for how they compete. So, in this regard, our focus will be on understanding some of the following topics. Why is digital strategy and innovation at the heart of competitive advantage? What is the role of a chief technology officer? Is this role different from the well-known role of a chief information officer? What skills does the chief technology officer need? And are there different types of roles that chief technology officers play depending upon the nature of the company? So, I look forward to talking about these topics in the modules to be coming up soon, and I look forward to seeing you.

Video 2: CTO: Role and Duties

So, what are the roles of a chief technology officer, and how do we understand the term chief technology officer?

The role of a chief technology officer originated during the dot-com boom revolution. If you remember, companies like Amazon, E*Trade, eBay, these were some of the forerunners of the dot-com revolution. These were companies started by founders who were very knowledgeable about technology. But more importantly, their vision was that technology could be the foundation. Creating a new business, a new business strategy, creating business on the internet. So, in during those times, there was a need for a person who could complement the entrepreneurial vision of the founders' by overseeing the development of the technology infrastructure. Working with technology vendors and creating the technology strategy in such a way that the infrastructure was robust, was reliable, it was scalable because after all, how can you do business on a technology platform if it is not reliable, scalable and flexible? So, that was the impetus for the role of a chief technology officer. Originally, very much focused upon creating a vision for technology, architecting the technology platform, thinking about what are the emerging technologies, and how can they all be integrated together seamlessly to deliver product, service and customer offerings. Today, after 20 years, that role continues to be still relevant, but it has grown to be even more fundamental into how businesses operate on a technology foundation. Even as companies have grown larger, they have felt the necessity to continue to have a chief technology officer. So, who is a chief technology officer? The chief technology officer is an executive who oversees the technology vision and direction and strategy for the company. Such a person is responsible for elements such as, what are the key technologies that we will incorporate into our infrastructure? Where will we source those technologies from? With which vendors will we form partnerships? But beyond that, the role of a chief technology officer has also continued to evolve into an external focus on the customers such as what will be the product vision? How will we make our products available? How will we do experiments with our customers? So, interestingly, the chief technology officer is not just a technology visionary, but increasingly one of the external faces of the company. And the chief technology officer increasingly is part of the C-suite along with the CEO, the chief operating officer and other chief executives.

So, what are some of the duties, what are some of the things that a chief technology officer does? A chief technology officer develops the long-term technology strategy and vision of the company. Secondly, a chief technology officer identifies the right technology stack to translate the business model and the business vision into a reliable and robust technology strategy. Third, the chief technology officer is also responsible for recruiting talent, particularly the software designers, the product architectures, the engineers, the database architects, the ones who are important in continuing to build and enhance the technology infrastructure. And the chief technology officer also represents the technical side of the company to critical stakeholders, whether it be the board of directors, whether it be customers or whether it be suppliers. In other words, the role of a chief technology officer is to complement the technology side of the business, as the CEO and business executives talk about the business side of the

organisation and be able to translate the business strategy into the technology strategy and vice versa. Meaning that, how will the technology strategy enable the business strategy? So, as you can see, this is a pretty translational or boundary spanning role, and that's the growth opportunity of the chief technology officer.

Video 3: Value Delivery by CTOs

How do Chief Technology Officers deliver value?

Are there dimensions of value that we can define and understand so that we can assess what makes a good CTO and what is their purpose in an organisation? So, we will identify three dimensions of value delivery by a Chief Technology Officer. They are innovation, purpose and partnerships. So, let's understand each one of them in turn. Innovation: Today, it is even more clear that digital innovation is the engine of growth and competitive advantage. As primary facilitators of a firm's technology strategy, CTOs control the levers that accelerate discovery and innovation. Today, innovation is a competitive battleground, and Chief Technology Officers can shine a light on the technology direction. What are the big broad trends and what does it mean to business? For example, what is the significance of a cloud technology for business? How does it help us redefine customer relationships? How does it help us create new products and services to the customers? Today, automated driving is driving in the cloud, so the cloud has significant implications for autonomous vehicles. Similarly, Internet of technology. What is the implication of that for a manufacturing organisation? How will analytics help us redefine our marketing strategy? These are the kind of ways in which a Chief Technology Officer can help an organisation understand the implications of technology for their firm's innovation. CTOs are indeed chief innovators, both of technology as well as of the business models. They should, for example, be able to see how cloud, AI or quantum computing can transform new product innovation, customer relationships, operations or even new business models. So, to summarise it, CTOs are catalysts and stimulants of new possibilities made feasible through digital innovation.

The second dimension of CTO value, let's call it purpose. In every organisation, one of the challenges is how are we going to connect a new idea with how do we make a business case for it. The easy one in an organisation is to make a financial business case. But a financial business case can be very conservative. What are the values? What are the ways in which we can inspire the strategic business case? In today's economy, where the purpose of business is not just to make profit but also to be conscious of the environment, conscious of society, are there broad values that can inspire how do we think about that innovation idea? CTOs can make a business case around technology, not just the financial case, but they can also steer attention toward a strategic business case. They can help answer questions such as: Will this innovation reduce environmental impact? Will it reduce job stress? Will it help us reskill our talent to become future-ready? CTOs can also help drive attention toward responsible computing, a term that we are beginning to use more and more, especially with AI. By helping answer, hard-to-answer but important questions such as, will this minimise the impact of the infrastructure investment on the environment? Will we be able to use citizen data in ethical ways? Will we be able to cater to humanity that we serve? So, as

you can see, beyond innovation, the purpose dimension refers to how can CTOs build an inspirational business case.

The third element of value delivery, let's call it partnerships. Today, innovation and value creation no longer occurs only inside the firm, but it occurs outside the boundaries of the firm, between the firm and its current and new partners. CTOs are the glue to bring a partnership ecosystem together for the company, both existing partnerships and new partnerships. They can help develop partnerships with other companies, especially those that specialise in emerging technologies or new digital innovation ideas. In a way, CTOs have a front seat view on digital innovation ideas, and they know who is doing them well in ways they can complement the knowledge and success of their own organisation. So, they're at the front end of, how do we build these relationships. Additionally, CTOs are also a translational voice to customers. They can help an organisation educate its customers about the potential products and services that can arise from digital innovation, from the digital infrastructure, from the digital investments. So, we can say that ecosystems and partnerships are vital to unlocking digital innovation and value. It can help answer specific questions and the CTOs can play a role in addressing questions such as: What will be the data sharing policies and practices with our partners? What will be the policies for compliance? How will workflows extend outside our organisation into our ecosystem and into our partners? Will there be a common approach to addressing cybersecurity needs? What in open innovation opportunities will we pursue? These are elements of what we call the partnership dimension. So, to summarise, the value created by the CTO for any organisation is defined in terms of innovation, purpose and partnerships.

Video 4: CTO vs CIO

Here is an important question. How is the role of a CTO different from that of a CIO? After all, the Chief Information Officer role is very well known. It's been in existence for a very long time. Why do we need a CTO today? How is that role different from what a CIO does? There are many ways of looking at the distinctions between these roles, and we will go through some of those distinctions to identify the fact that the CTO and the CIO roles are in some ways synergistic and some ways distinct and unique. We can describe the CIO role as more inward looking and focused on improving business efficiency and effectiveness, particularly by focusing on business processes and data. A CIO's contribution to an organisation is how can we enhance technology business alignment to improve operating efficiency, innovation, speed and agility. In contrast, the role of a CTO is more outward looking.

The CTO is focused on new technologies and vendor partnerships. CTO is focused upon how to use the technology to improve customer offerings, and how to be an advocate for the innovative product portfolio with customers. And the CTO's role is focused upon learning how to support the voice of the customer internal to the organisation. So, CTO is more outward looking, and the CIO is more inward looking. We can advance this idea further by saying that the CIO's focus on internal IT operations means the CIO is focused on the IT infrastructure, business processes, core systems, process automation and data warehousing. Their stakeholder are the internal

users, and the metrics of their success are cost of IT operations, reliability and availability. On the other hand, the CTO being outward looking, their focus is on technology trends, R&D, new products, new services, customer advocacy, voice of the customer. By focusing up on their customers, they have a much more direct impact on revenue and sales. Now, building further, we can say that both the CTO and the CIO are necessary and important because they're connected to the idea that firms must be more strategic and innovative through their use of technology. After all, today, competitive advantage comes from IT and digital offerings.

However, the CIO focuses on some of these aspects. How do you apply IT to internal operations? How do you manage IT personnel and IT services and IT applications? How do you reduce the cost of the internal transactions? How do you improve short-term IT performance? How is the CTO role different? The CTO focuses on how can we apply technology to products and services, especially to creating new products and new services. How can we manage digital R&D and innovation? How can we stimulate the creation of new products and services through technology? In other words, mastering the innovation process both internal and external? How do we position the company for long-term competitive advantage? How do we build new partnerships and new ecosystems? Let's think about the same idea in a different way, and you'll see that reflected here in this graphic. Both of them have a shared responsibility for data privacy, innovation strategy, ecosystem strategy, software development life cycle, cyber security and working with the C-Suite. However, the CIO takes these concepts and applies them to the internal organisation, such as the supply chain management force, the customer relationship process, the HR process. How do we enhance the end-user experience inside the organisation? How do we ensure the continuity of business in the face of potential disruptions? How do we enhance the scalability of the organisation? What does the CTO do? Out of the same shared responsibility for innovation, ecosystem and software development life cycle and cyber security, the CTO focuses externally on what should be the customer-oriented technology strategy. What should be the portfolio of product and service offerings to the customers? What should be the external-oriented technology architecture? And this is important. The CIO is focused on the internal technology architecture and the CTO is focused on the external technology architecture. So, as you can see, both roles important. One does not replace the other, but they are diverging because of the importance of digital innovation and strategy.

Video 5: Qualities of a CTO

What are the qualities of a chief technology officer? We'll summarise the qualities in four dimensions. Recall that we say the chief technology officer's primary role is to be external-focused. So, their role is in understanding customer needs and identifying partnership opportunities. So, their ability to understand customer needs and external trends and external partners is the first important quality. Second one is strategic planning. Third one is team management and fourth one is project management.

We can think about these by identifying that a chief technology officer essentially has four different personas about how they are viewed in the organisation and how those mean that these four qualities are important.

By now, it's clear that the chief technology officer is a digital business leader. Somebody who can understand how to fuse together technology and business in creating new products, new services, new business models. Therefore, their ability to be a strategy catalyst, their ability to know how to conduct strategic planning and to understand the needs of the customers is pretty important to their success as a digital business leader.

A second important persona that helps us think about the qualities of a CTO is a digital innovator. A CTO is an innovation catalyst, somebody who identifies the sweet spots of opportunity where you can improve business through technology. So, therefore, the important qualities are strategic planning and project management. Understanding how to apply strategy thinking to innovation ideas, and then how to deliver upon them through project management.

The third important persona is digital strategy catalyst. Connected again with the business leader idea, how to help educate others about thinking about digital innovation. Very often a chief technology officer is an evangelist, who can help other members of the organisation learn about what is digital innovation and how should they be thinking about in their own area of activity, whether it be customer relationships or supply chain or name it.

The fourth important persona is that of a business enabler of technology leverage. What does that mean? Today, firm's success is how well they can leverage technology on an ongoing basis in innovation. While a CTO can be a source of ideas, success is when others are also able to think like a CTO. So, he or she is a business enabler of technology leverage. So, let's go back to once again defining the qualities of a CTO: Customer needs, strategic planning, team management and project management. Under project management, we can now identify a couple of important other subdimensions. One of that is financial planning and management. Remember, we said that one of the ways in which CTO delivers value is by purpose, making the business case. So, a CTO should be skilled in financial management to help build the business case. Similarly, as a project manager, CTO should have some operations understanding, because projects are like running operations. So, those are additional dimensions of project management.

We can describe the qualities of a CTO also in a different way. They are: be a champion of the customer, be a technology visionary, be an infrastructure commander and be a big picture thinker. Customer champion, meaning you are the external person. So, the CTO should be skilled in being the voice of the customer, listening to the customer, translating that into ideas and bringing them into the organisation, and similarly, taking ideas from the organisation to the customer. Technology visionary. Be open to the big trends, understand the actions of technology companies and read the TVs to know where trends are going. Today, for example, we are hearing a lot about generative AI. It should be the CTO who should be aware of what generative AI is, and before there is too much ambiguity about it, be able to help the organisation learn and vision what role generative AI will play in that company. Infrastructure commander. Remember, I said the CIO is internal-focused, CTO is external-focused. Firms are discovering that

they need to bury and build two different infrastructures. One internal facing, one external facing. And the CTO is the commander, the orchestrator, the architect of that external architecture. Certainly, big picture thinker. He or she best understands what disruptive impact technology will likely have and how to prepare the organisation for that. So, that's the big picture quality.

Video 6: Factors Affecting a CTO's Role

What factors affect a CTO's role? Do CTOs play the same role in every organisation, or are there ways in which we can understand what changes the role and expectations of a CTO? So, we will identify four factors and describe how they influence the role of the CTO.

What are these four factors? The first one we'll talk about is the type of industry sector in terms of tech versus non-tech. Second, we'll talk about the size of the organisation, small versus large. Third, we'll talk about company maturity, a start-up or incumbent or a more mature organisation. And then finally, is it in the product business or is it in the service business?

So, let's look at each one of these factors turn by turn. Industry sector. Given that our conversation is about digital innovation, digital economy, it's more meaningful to think about industry sector as tech versus non-tech.

Tech is companies that are the producers of technology products and services. They don't just include the traditional IT companies like hardware and software, but they increasingly include digital companies. Amazon would be a digital company or a tech company. Apple is a tech company; Netflix is a tech company.

Who are the non-tech companies? These are the companies which were traditionally created to be consumers of IT to serve their customers. So, CPG companies, consumer product companies. Let's take Hindustan Lever, Maruti or Procter & Gamble, Reliance, Tata Hotels. All of these, so whether it be healthcare, retail, tourism, hospitality, retail, different examples. They were not born digital, but they are the consumers of IT, so we call them non-tech companies.

In a tech company, one unique aspect is that most of the colleagues of a CTO, those who are in the C-Suite, they are themselves tech visionaries. Amazon is a tech company. Jeff Bezos, when he started Amazon, he understood the Internet. He did not need help of being a technology visionary. Steve Jobs was a tech visionary. Google, it's a company full of tech visionaries. So, the business executives are tech visionaries, and you don't need the CTO to be focusing too much on that in terms of what are the business innovation opportunities. But the role of a CTO in a tech company is how do we translate that vision into products, services and infrastructure. Interestingly, in many of the tech companies, the role of a CIO is less important, whereas the role of a CTO is more important. In other words, the CTO is the primary owner, champion and facilitator of everything that even a CIO does. So, translating the vision into product, services, infrastructure, everything is the role of a CTO, much more prominent.

In a non-tech company, the CIO still has an important role. So, the CTO has to complement the CIO role in the ways we discussed, internal versus external. Because many of the business executives are less tech-savvy, the role of a CTO is more in terms of educate, help others learn about the digital, build, help build the infrastructure, translate the digital into products and services and innovate. So, you can see a very clear distinction.

Tech companies translate the vision, whereas in non-tech companies educate, build, translate, innovate.

Let's look at the second factor, and that is size. In small companies, simply put, everybody does everything. Small group, so a CTO tends to be not just a technology officer, very often becomes the Chief Marketing Officer, Chief Revenue Officer or the Chief Growth Officer. So, the CTO has a more prominent front-end facing role with customers, suppliers and external partners, building innovation, purpose and partnerships.

In a medium-sized organisation, there are more executives; there are more colleagues, and the role of the CTO starts pivoting from doing everything to being a member of the team and taking on a more specialised role, but important role. And we can say the CTO's role translates into organisation building, acquiring and leading people and skills, developing the technology vision, orchestrating the ecosystem and finding those open innovation networks. So, you can see from doing all-purpose everything to start doing specific things in collaboration. And that's an important word, collaboration, ability to collaborate with others.

What about large organisations? Even more specialised and collaborative member of a bigger team. Remember we said, a CTO is a big-picture thinker. Much more important to look at what's coming in the future, what are the technology trends, how should we be thinking about them? So, you can see how the role starts changing depending upon the size of the organisation.

The third factor is maturity of the organisation. In a small start-up, everybody is much more external-oriented because there's a race between developing a product, the minimum viable product, finding the first, second, third customer, finding the source of funding, and it's a frenzy. It's ad hoc because it's survival. So, product development, product launch, finding the customer, acquiring more finances to keep going like that. So, that's where the role of a CTO becomes much more frenzied, ad hoc, and all hands-on deck. In a mature organisation, the role becomes much more deliberative, not frenzied. It becomes much more well-defined, not ad hoc. But it still remains external-oriented, but not just through partnerships, but also by culture building through collaborations to instilling teams.

So, again you can see the distinction in growing from a start-up to a mature organisation. The fourth dimension is, what's your primary offering? Are you a product company, or are you a software company? If you're a product company, then the focus is more upon R&D, voice of the customer, concept testing, A/B testing, and so on. If you're a software company, then much stronger emphasis on software development

lifecycle, project management, maturity or software development and ensuring product quality from a software perspective. Small distinctions but important distinctions. So, let's summarise it by saying that the role of a CTO varies depending upon the sector, tech versus non-tech, size, maturity, and what are you making, product versus software.

Video 7: CTO: Role in Start-Ups

Let's dig deeper into what does the CTO do as member of a startup. Because we already said that one size does not fit all, CTOs are called upon to do some slightly different things in startups versus other company. So, what do they do in startups? Let's dig deeper.

In a startup, to the business, the CTO is the tech guy. And to the technology team, the CTO is the business guy, meaning the CTO is the translator between the business and the tech side of the startup. The startup CTO needs to wear many hats. The CTO is generally hired to be hands-on in terms of development. CTO also needs to have fair degree of business domain knowledge, needs to have the vision and the ability to understand the customer needs. And by the way, there's an important distinction between customer needs and customer wants. Steve Jobs was famous for saying, "We give the customer what they will need, not what they want." And that's an important distinction, meaning that it's really you're trying to understand the customer in the context of their life and how technology will make their lives better. Sometimes those needs are things that the customer themselves may not be aware of. Hence, it's not just sufficing their needs, the CTO also plays an important role in educating the customer about the product offering and it helps how it serves an important customer want.

In addition, the CTO also plays a role in translating the vision and the mission of the company, identifies the pitfalls and barriers to progress, and finds pragmatic solutions. What does that mean? If the company is going to run out of server capacity, he or she is the visionary, says, we need to pivot to the cloud. If the company needs analytics capability, he or she finds out where do we find the talent before the need becomes apparent? So, that's what we mean by finding pragmatic solutions. If funding is running low, then the CTO is important, finding out how can we bootstrap, how can we keep the product going even with the limited funding that we have available? If a key technology person leaves the company, the CTO is the one who has to find a solution so that the product development itself does not slow down because it's a race to find the minimum viable product, it's a race to find the first customer, it's a race to find the second customer. That's the key to success in a startup.

The CTO also has to be committed to finding a culture that works. Remember, we said the culture of a startup is frenzied, chaotic and ad hoc. It can burn people out. So, along with the CEO, sometimes the CTO has an important role in lifting the morale, keeps the troops going and those are important elements. So, what does the CTO do in a startup? We can say a role in minimum viable product development, a role in improving the user experience, in overseeing the application architecture, in enhancing the vendor and customer relationships and in talent management. So, that's what a CTO does in a startup.

Video 8: CTO: Role in Mid and Large Firms

What does the CTO do in a midsize firm? Unlike a startup, in a midsize firm, the CTO has fewer hats to wear because there are more people. There is more differentiation and specialisation. There is somebody doing marketing, there's somebody doing manufacturing, there's somebody doing customer relationships. So, the CTO has fewer hats to wear, but now has to be more collaborative as a member of the team. The CTO in a mid-sized organisation is a creator and overseer of the technology strategy. He or she envisions how technology will be used and how do we implement new technologies. The CTO will increase the maturity of the technology processes because now you need to go from ad hoc to less chaotic, ad hoc to more organised structure and process. So, the CTO moves from being more hands-on in a startup to being less hands-on and being more of an enabler of teams, culture and methodologies.

The CTO's role becomes one, about building a larger team and formalising roles. For example, building a cloud team, building an analytics team, building a mobility team because you need to attract more talent and create very much distinct roles so that their identities are clear but at the same time encourage collaboration so that they can work together. So, building a team is very important. Rather than having a deep knowledge in every aspect, the CTO becomes more of a big picture thinker who can articulate a global vision and translate that into specific projects or technology initiatives. The CTO needs to have a good understanding of what is urgent versus what is important.

What about a large firm? In a large firm, there is more specialisation, there are more people doing specialised roles. So, in that company, the role of a CTO becomes more of an evangelist and a strategic thinker. The CTO still sets the strategy, culture and technology direction, but is more focused on future proofing the business, meaning that we are doing well today, what are the shocks, what are the trends that we should be vigilant about and how will the business change and how do we position the business to change before it becomes irrelevant or before a competitor makes us obsolete. Here, a CTO is more of a charismatic visionary. He or she is a spokesperson and very much an integral member of the leadership team, very much a member of the board, helping connect to the leaders of other companies in the same industry, in tech companies. So, you can see the variation of a CTO role from a startup to a medium sized company to a large firm.

Video 9: Skills of a CTO

What are the skills of a CTO? By now it should be clear that there are a core set of skills that define a CTO. What are they? First, strategic thinking. A CTO must be able to see the big picture about business and technology direction, understand the industry, understand the firm's competitive strategy and how technology and strategy can blend together and help educate the leadership by being a member of team in strategic thinking, envisioning the future, envisioning the future direction of product services and customer offerings, envisioning future business models. Second important skill is innovation catalyst. Finding those sweet spots of opportunity as technology trends and business needs collide. How can we enhance customer relationships? How can we improve operations? So, for example, Starbucks. Starbucks' success in enriching the

customer interface through an omnichannel, through apps, through rewards programs, these are all examples of innovation around enriching the customer experience. CTO has to be a catalyst in that innovation. Or if you are an automobile company like Maruti, how can you use technology to streamline supply chain? To make supply chain more flexible, adaptive and less costly? That's an innovation opportunity. So, those are examples of a CTO conducting their role as an innovation catalyst. A third important skill is cross-functional acumen. The ability to marry technology to business means a CTO must be understanding of the connections between marketing, supply chain, manufacturing, operations, warehousing, aftersales service, because the fundamental key to success in a digital economy is cross-disciplinary innovation. So, the ability to think across boundaries of these functional silos, and then how do you apply technology? That's what we mean as the cross-functional acumen.

The CTO must have the skill of being a continuous learner. This is one role where learning never stops because there are new technologies, new ideas and potentially disruption. The CTO ensures that the firm doesn't stand in its own place, doesn't bask in the glory of its recent success, because you start thinking about what next. So, the CTO themselves must be a continuous learner. Learning from customers, learning from vendors, learning from colleagues and processing that learning into the next idea. Another important skill; communication. As an enabler, as an orchestrator, as a team player, collaborator, if you can communicate, you cannot be effective as a CTO. So, learning how to communicate with customers, how to communicate with internal colleagues, how to communicate with employees, how to communicate with investors, how to communicate with the public, subtly different. Today we have various means of communication. We have internal communication; we have channels such as Slack. Then there are social media communication. So, understanding the role and relevance of different communication media and different messages is an important element of the communication skill.

People management, another important skill because fundamentally, as you have observed, in their evolution from a startup to a medium to large company, one of the key transitions a CTO goes through is from being a force of one to being an enabler of people, acquiring talent, retaining talent, motivating talent in the face of a battle for talent. So, people management skill is a very important skill. Last but not least, digital acumen. We already talked about cross-functional acumen. So, digital acumen is the ability to understand the evolution of technology, the ability to understand the implications of that for product, process and operations is called digital acumen. Digital acumen is also the ability to translate those ideas in a way that can be understood by others. So, we can summarise the skills once again as strategic thinking, innovation catalyst, cross-functional acumen, continuous learning, people management and digital acumen.

Video 10: Module Summary

So, we have talked about different ways of introducing the role of the CTO. Who is the CTO?

How is the role of a CTO different from that of a CIO? How is a CTO role changing across organisations? So, what's the future of the CTO? The future of the CTO is in marrying the power of people with the power of technology, and that potential is infinite. As new advances in technology are embraced, there will be new roles and new skills to learn, new ways of thinking, and the leaders will need to guide their people through these changes. Motivating them, and when necessary, quashing the fears of the unknown. As companies scale, so does the role of the CTO. They will need to focus more and more on developing the potential of their people, moving away from purely technical and toward how people and teams can work together for the good of the business.