David Starr:	Welcome to the Microsoft Industry Experiences Team podcast. I'm your host, David Starr, and in this series you'll hear from leaders across various industries, discussing the impact of digital disruption and innovation, sharing how they've used Azure to transform their business. You can find our team online at aka.ms/indxp or on Twitter at @industryXP.
	For a very special set of episodes, we've partnered with Vince [Manzion 00:00:40] to highlight the thought leadership of our team's principle program managers who are doing are things within their specific industries. And now, your host for this episode, Vince [Manzion 00:00:51].
Vince:	In this special series of the podcast I sit down with leaders from Microsoft that are helping important sectors of industry to transform and thrive through the use of this innovative cloud technology.
	In this episode my guest is David Houlding, worldwide industry lead for healthcare on the newly created Industry Experiences Team. In this episode David and I discuss his extensive experience and background in the healthcare industry, the transformation going on in healthcare, emerging technologies like block chain, AI and machine learning, as part of Microsoft's and Azure's commitment to the segment and why customers and partners should invest here.
	This episode of the podcast is sponsored by Microsoft and the Industry Experiences Team. Thank you for listening and I hope you enjoy this episode.
	David, welcome to the podcast.
David Houlding:	Thank you. It's great to be here. Thanks for the opportunity
Vince:	Thank you for taking the time today. You're the principal healthcare lead and you focus on the healthcare industry worldwide as part this newly organized Microsoft C&E team under Paul [Nare 00:02:02]. I'm excited to hear from you about your role and focus, Microsoft and Azure's value proposition around healthcare, this amazing transformation going on, and why it matters to customers and partners. So, welcome.
David Houlding:	Thanks. Yeah. So, the role is really focused 100% on healthcare, and by healthcare, provider healthcare like hospitals, payer healthcare, the health insurers, pharmaceuticals, life sciences, worldwide as you said, but the role is really to understand and track healthcare trends, what are the challenges, what are the pain points, what are the strategies going forward, what are the business goals, and it's to identify opportunities for Microsoft, Azure, to really empower the healthcare organizations to better achieve those business goals. Generally in achieving a business goal there's lots of things that need to be done and satisfied, some of those ... If you think of it as a puzzle, some of those puzzle pieces are technology but some are not, and so we're really striving to help the

healthcare industry and organizations understand what are all the pieces to solve a business problem or achieve a business goal, and then how does technology fit into that.

Now, the typical business goals for healthcare, they can be reducing healthcare costs. Healthcare has become incredibly expensive. There's a real affordability issue. Improving the quality of patient care and improving patient outcomes are key business goals. Cloud computing is a very key technology within the portfolio for Microsoft and is particularly relevant in terms of helping to reduce healthcare costs and helping to enable some of those new transformative technologies like AI machine learning, block chain, internet of things or internet of medical things as we say.

Another part of the role is also to help healthcare organizations understand how to manage security-privacy compliance to achieve compliance with regulations and data protection laws which is very important in the use of any technology, but especially cloud computing.

Vince: I want to differentiate for our listeners here who might know a little bit about Microsoft and healthcare in that there is both a healthcare sales organization at Microsoft and a healthcare industry team, and your role is differentiated in that it's in the C&E, or the engineering organization, or C&AI I think it really what's not called, and that's different, and your focus is a little bit different. Can you expand on that a little bit?

David Houlding: Yes. So the C is for cloud and E is for enterprise, and of course we all know what AI, artificial intelligence is. So, the sales organization, or the sales part of healthcare at Microsoft, is really tasked with supporting sales, individual sales worldwide, and we have a massive and astounding team deep in their knowledge and connections into the healthcare industry.

Now, where my role and my team differs is we're really focused on the industry as a whole, not specific sales events. We may participate on specific engagements with healthcare organizations to stay grounded, get proof points, case studies, success stories, that kind of thing, but we're really looking to help the industry as a whole understand, again, what are the trends, challenges, pain points, strategies, and how can they achieve their business goals using technology.

Vince: From what I understand as well, you're part of the feedback loop back to the engineering organization on what [inaudible 00:05:25].

David Houlding: Yeah. So that's another aspect of the role is, we call it voice of the customers, so in tracking the trends and the challenges and pain points and so on. We can see what's coming down the pipeline from a healthcare industry standpoint worldwide and where we act as a feedback loop back into the engineering

group at Microsoft to help them understand what are the future needs as they're planning out their next generation solutions.

Vince: You recently joined Microsoft, you have an extensive background in healthcare in this vertical specifically, I was hoping you could tell our listeners a little bit more about your background and how you got to this spot in your life and career?

David Houlding: Yeah. So, over 24 years of experiencing, a lot of that in healthcare and security-privacy compliance, very deep in that aspect, I got certified in security and privacy some time ago. It's such a critical component for healthcare that's heavily regulated. A lot of regulations like [Keppa 00:06:24] and data protection laws like GDPR, et cetera, worldwide, and healthcare is obviously very cautious in how they protect the sensitive healthcare information. So I got into security-privacy compliance, more recently block chain and AI machine learning as it relates to both security and block chain.

As far as healthcare is concerned, I started off in the payer side of healthcare, so the health insurance. Their task was managing membership and eligibility to a payer patient known as a member, a member of the health plan, and eligibility of the rules regarding what kind of benefits you can get on the plan, what kind of services are covered, that kind of thing, but managing claims, adjudication, and all that side of it.

Then, I actually worked for Intel for over 10 years. Great team. Great mission. I was Director of Healthcare Privacy and Security with the Intel Health and Med Sciences Teams, so very similar role. I was focused 100% on healthcare, also providers, payers, pharmaceutical, life sciences, also worldwide, very deep on the security-privacy compliance side of the healthcare. That's where I got into block chain and AI machine learning, but it was very broadly focused. So not just payer, it was all the different segments, and just like my role at Microsoft, very broadly focused across the healthcare industry, all of the segments.

Vince: So, new to Microsoft as we discussed, but what was the best piece of advice you received when you took this role or what was the biggest insight you've had since you took this role?

David Houlding: There's the things you learn during orientation, which was very smooth by the way, very impressive. One of the softer things that you learn as you get into the organization is there's just so much knowledge and talent and expertise across the organization, and it's really about networking and collaborations, so reaching out and making contact. So just collaborating on goals and solutions to make sure we put the best solution forward as an organization.

Vince: So, healthcare is a fascinating area in this transformation because it is so critical to saving and improving lives, and longevity, and we all experience or intersect with healthcare at some point in our lives. This transformation has been

exhilarating and I'm hoping you could share with our listeners what you've been seeing happening and maybe something you're seeing happen now that you didn't even expect to see a year, 18 months ago in this transformation?

David Houlding: Yeah, there's super exciting things happening across healthcare, and many, many things happening concurrently, whether it's AI machine learning being applied to diagnostic imaging, for dermatology or radiology, or VR, virtual reality, augmented reality, mixed reality, being applied to patient's engagement, training of healthcare workers, planning of surgeries, block chain to enable whole new levels of collaboration across consortiums of healthcare organizations. All these things are going on in parallel. There's a lot of transformation in healthcare as far as technology is concerned.

Internet of medical things, like IOT but for healthcare, internet of medical things, is poised to acquire unprecedented levels of data from inside patients, from on patients, from around patients, and that's going to feed the analytics, the AI machine learning, which will deliver a whole new levels of insights into healthcare in new real time. So it's really going to change the method of healthcare delivery and greatly improve things, I think.

The emergence of 5G is another one. The 5G wireless I going to pave the way for all kinds of new healthcare workloads, if you will, to be run from the cloud. As you may know, 5G has very low latencies, so less than one millisecond, it's super high bandwidth, it's up to ... I think it's 10 gigabits per second, and just can support a much larger density of internet of things.

So, if you can imagine all these different sensors, and many of them are going to be healthcare related, internet of medical things, especially in urban environments can have an incredibly dense network of things, collecting data for the benefit of healthcare. So yeah, there are super exciting things going in healthcare and transforming healthcare, concurrently on multiple fronts.

Vince: You mentioned a couple points here, one is the internet of medical things, that's a new term for me but I believe it's medical devices and IOT, a hybrid between those terms, so that's all of the wearable devices but it's also the diagnostic devices in hospital or in doctor's offices-

David Houlding: Absolutely. It could be anything from devices that are even in patients, on patients, like wearables as you mentioned in any kind of healthcare setting, in the patient room, it could because specialized equipment like MRI machines and so forth, but any devices that is wireless or connected is collecting that is used for the delivery of healthcare.

Vince: You also mentioned 5G, and when you mentioned that I was thinking more about the 20 million Americans that don't have high speed broadband and patient care that can be delivered to those communities, those rural

communities in the United States, and elsewhere, that aren't able to be provided today because the lack of bandwidth.

David Houlding: Yeah, absolutely. It will actually enable high speed internet access via wide area wireless networks, so very exciting in terms of enabling a much more even access to the internet and to healthcare services. A lot of healthcare services are being delivered, a lot of patient engagement is happening, so whether it's healthcare providers, healthcare payers, they're creating patient portals, they're engaging patients in whole new ways via apps and even devices and wearables. This kind of improved access will really help to pave the way for that kind of engagement.

Vince: It's exciting times.

David Houlding: Absolutely. Yeah, a lot going on and it keeps my job interesting because the trends are always changing and there's new technologies emerging, new use cases emerging, so it definitely keeps me engaged.

Vince: I've seen you've written some articles on block chain, and you mentioned blockchain earlier, so I'd like to dive in a little bit more here because there's a lot of excitement coming from you and the team here around blockchain, can you expand here on the some of the work that's going on for blockchain in healthcare?

David Houlding: Yes. So, blockchain is ... I think of it as a middleware. It's a middleware between a consortium of healthcare organizations, so whether it's providers, payers, pharmaceuticals, the life sciences, a network of healthcare organizations which can collaborate via blockchain. So, blockchain is really the shared ledger that organizations in the consortium can write and read from and can actually have executable code as well in the form of smart contracts. So, it creates a whole new level of collaboration amongst consortiums of healthcare organizations.

In contrast, without blockchain, all the data is being in these centralized data bases inside organizations. There's being limited, if any, sharing of data. I think there's general realization that a portion of the data that's captured by healthcare organizations today could be shared for the benefit of achieving business goals, including improving the quality of healthcare, improving patient outcomes, and reducing the cost of healthcare, what's been lacking in the past is just a way to do that, that sharing and that collaboration, a targeted and secure manner. That's what blockchain enables. Where we're seeing blockchain take hold early on is amongst networks of healthcare organizations that already exist and blockchain is being dropped in and delivering new value in terms of eliminating single points of failure, making things much more transparent, efficient, enabling new business models.

So, examples are drug supply chain. In drug supply chain medication is produced by pharmaceutical companies, it's sent to distributors, distributors pass it on to

dispensaries or pharmacies, and so tracking drugs through that supply chain, one can route out counterfeit drugs, which are unsafe, and get new levels of transparency for all the players in the supply chain for the benefit of operational efficiency and cost reduction. At the point of dispensing the drugs or medicines, the pharmacist and patient, or family caregiver, can verify the authenticity, the providence and the safety of the medicine, which can be very important if it's coming over a channel like the internet. That's just one area where blockchain can be applied.

There's medial device track and trace, so similar to drug supply chain but tracking medical devices from manufacturing through point of sale and then through the life cycle of use, even multiple life cycles of use. So if there's a recall on a particular type of medical device one can look up very quickly on blockchain which are exactly the devices that are affected and execute that recall in days instead of a year or more, which it takes today. There's real patient safety benefits in being able to accelerate that kind of recall. There's provider credentialing, tracking doctors credentials on blockchain and the verification of those credentials, doctors can only practice once ... First they have to have the right credentials, but those credentials have to be verified by each organization they work for. So, if some doctors work at multiple hospitals, then that verification needs to be done every two years. So, there's a huge amount of redundant effort in just verifying credentials. Blockchain can be used to have those credentials, record the verification of those credentials, eliminate a lot of that redundancy, accelerate the time the doctor is being able patient practice. There's real benefits and cost reduction associated with that. There's literally about 10 use cases that we're working on with partners as far as blockchain in healthcare, but super exciting.

Vince: It is exciting. You brought up some use case examples that I didn't even think about. I knew about the product recall aspect and sort of the supply chain aspects with product attestation, but you brought up a couple of other examples that I just hadn't thought about.

What about from hospital from hospital from organization to providers, providers back and forth, isn't there a specific use case you might appeal ... I'd like you to [crosstalk 00:16:54] on that one a little bit because I think you touched on it.

David Houlding: Yeah. In the US we have providers and payers are separate, a private healthcare system, and there are exceptions to that integrated delivery network, some organizations are both providers and payers, but generally providers like hospitals are separate from payers like health insurance companies. There's one use case that we call it clearing house use case, which today there's an organization, an intermediary if you will, what's called a clearing house that sits between providers and payers, so when you go to a doctor or a hospital and you get a service there's literally transactions that go through the clearing house between the provider and the payer such as an eligibility check, are you eligible for this particular service? Do you have this benefit on your healthcare plan?

Pre-authorization, so can we pre-authorize for this expensive procedure to make sure that we're going to get reimbursed? Submission of the actual claim once the service is being delivered, checking out claim status, remittence of bias, those are all transaction that typically go through a clearing house.

Now, a clearing house is a hub and spoke architecture, so the clearing house is the hub and the spoke so the connections out to the different providers and payers. Where blockchain can add value there is blockchain can be the middleware, the mechanism, whereby the providers collaborate directly with the payers, so there's no hub. There's no single point of failure. There's a lot of cost reduction associated with that, with the transactions propagating through blockchain versus through this centralized single point of failure. There's a clearing house use case in healthcare for blockchain that is delivering very compelling benefits. It's one of the leading use cases in this act of pilots going on right now.

Vince: So, taking out some of the cost as well, right? All this paperwork, all this validation and processing that goes on right now in our system?

David Houlding: And accelerating because it happens pretty much real time as the transaction appears on the blockchain, but can be instantly visible pretty much across the blockchain network and can be processed, and results returned without having to go through an intermediate which can often add significant delays and often eliminates the single point of failure. So, today, if a clearing house goes down, the providers have essentially lost their connection with the payers. You don't have that problem with blockchain because there is no single point of failure.

Vince: I know Microsoft has a solution for blockchain on Azure, can you expand a little bit more about Microsoft's offerings in that area?

David Houlding: Yeah. We have the Azure blockchain workbench, which is a rapid prototyping environment for blockchain, and it could be used for healthcare, but also other industries. The notion is being able to access this cloud environment that has this Azure blockchain workbench, being able to define your use case, whether it's clearing house or drug supply chain, or medical device track and trace, or pretty much any use case. Defining that use case, defining the parameters around it, what kind of date will be stored on the blockchain, et cetera, being able to push a button and project the deliverables, the deployment artifacts, onto one of the three main stream blockchain, production blockchain platforms, Ethereum Enterprise, R3 Corda, Hyperledger Fabric, and being able to spin up blockchain notes in cloud, in Azure, to be able to test it.

This is really important right now because healthcare and many other industries are just getting it to the point of piloting blockchain, and so this kind of rapid prototyping environment where you can quickly get up and running with your blockchain and start testing, find out what works well, find out what you can improve, iterate and improve and evolve, this is what's really needed. So, this gives a path for healthcare organizations, or any type of organization that wants

to pilot blockchain, a fast path to create that prototype, get it up and running quickly in the cloud as opposed to having to ship hardware to each organization that's going to participate in the blockchain, they have to set it up in their DMZ, they have to open up firewall ports, et cetera, and that's a long process. You can just spin up a blockchain note in the cloud, have it join the blockchain network, and get to piloting and focusing on the business logic, the application logic, and improving, and iterating, and evolving.

Vince: I've read some of what you've written, and blockchain is not a panacea for all applications, and I believed you even talked about transaction buying being a factor here with transaction rates and response times.

David Houlding: Yeah, that's a great point. Blockchain, it's network bound. What we mean by that is its performance is determined by network characteristics, in particular the latency of the network, the bandwidth of the network to some extent, but most importantly the consensus algorithm or protocol by where the blockchain notes communicate with each other to maintain the consistency and validity of the shared ledger. So, different blockchains have different consensus algorithms and those have different performance characteristics.

To give you an idea of the scope of those, very public, extremely decentralized, un-trusted network like bitcoin can make assumptions about organizations and level of trust so the consensus algorithm needs to be very aggressive. The net effect of that is the [inaudible 00:22:08] is quite low. It can be less than 10 blocks per second committed to the bitcoin blockchain. In contrast, what we're talking about in healthcare, and most enterprise uses of blockchain, is what we call a private consortium blockchain that is ... Think of it as a blockchain island, it's a blockchain but it's only accessible by the organizations in that consortium that are very well know, very highly trusted. Now, when you have an environment like that you don't have to have an extremely aggressive and low throughput consensus algorithm. You can have a very streamlined consensus algorithm that gets very high throughput.

For example, COCO Framework, which Microsoft is also working on, stands for confidential consortium framework, this is a type of blockchain platform that streamlines a consensus algorithm to get a much higher throughput in terms of blocks per second. It can get up to ... I think it's roughly 2,000 blocks per second peak. But the other aspect of COCO Framework, and enterprise blockchains for private consortium blockchain use, they're often much stronger on the security side. COCO Framework has this notion of secure [inaudible 00:23:15] inside blockchain nodes, so being able to protect the confidentiality and integrity of the core code and data, and essentially having these secure [inaudible 00:23:23] at the core of each blockchain node being connected to the other blockchain nodes via secure links, so SSL or TLS links, gives you a very secure blockchain network. Such that even if malware landed on one of those nodes, one of those end points, it would be much more difficult for that malware to compromise the confidentiality or integrity of that blockchain network, or the data, that's being exchanged.

Vince:	Some really exciting information you're sharing here, David, and I'm hoping you're going to provide some links for our listeners in the show notes.
David Houlding:	Absolutely. Happy to do that. As your blockchain workbench is a great place to get started to start prototyping and learning and piloting your blockchain, whatever your use case.
Vince:	We also talked about another hot topic, AI. It's getting a lot of attention with Microsoft and other organizations today. Can you peel back a little bit more on the whole AI initiative within Microsoft and Azure and the use case examples specifically? You touched on a couple of the like diagnostics and the like, but maybe you can go into that a little bit deeper for our listeners.
David Houlding:	Yeah, AI and machine learning. According to Accenture, AI can potentially create 150 billion dollars of annual savings in the US healthcare economy by 2026, so just phenomenal potential, and the growth in AI health market is expected to reach, I think, 6.6 billion by 2012. So, incredible potential and growth trajectory for AL machine learning in healthcare. The use case where it's being applied, super exciting, it's things like diagnostic imaging. So, if you get dermatology, if you take a photograph of a mole on your skin, being able to run that through AI machine learning and have it tell you we need to do a biopsy because it has a high probability of being malignant. Or, hey, this mole is not an issue, this one is, there's a 99% confidence this is not malignant, no biopsy required. Things like radiology, if you get an x-ray or any kind of radiology MRI, being able to run that through AI machine learning to identify anomalies like it looks like there might be a tumor here, to help radiologists so they're not looking at thousands and thousands of images today. They can use AI machine learning as a tool to enable and to rapidly identify anomalies and focus more on patient care, up-level their job if you will. That's another super exciting area.

Often times when patients get diagnostic imaging they come in with a certain complaint, and there's a certain assumption about, hey, the patient probably has this kind of situation, let's run this MRI to verify it, but sometimes that assumption is wrong. What AI machine learning can help with is it can basically do a comprehensive ... Or you can actually have multiple AI machine learning models that get applied to an image to determine if there could be other issues at play. So, imagine you have a thousand different models applied to this one image to look for, a thousand different conditions, way more than a radiologist could ever do, and some of these conditions are so rare that a radiologist in their career may encounter one or two, or maybe none of them, but that can be captured in a model. So being able to run these images through AI machine learning models in triage, look for secondary issues that may not have been seen by the original consult with the provider and being able to triage ... Okay, these thousand images that were taken today, these three need to be looked at immediately because they've got life-threatening issues that may not have been seen before. So, having AI machine learning help radiologist in terms of of thousand, look at these three ones next, because the patients are in imminent danger, super exciting and it can be done nearly realtime. |

These can run in the cloud very efficiently, they can scale up as if thousand images come through in a batch, you can scale up your computer to process that very quickly, versus if you had to buy the hardware and have it on premise. It would take a lot of capital, first off, a big IT team to maintain that and ... Healthcare is trying to cut costs and maintaining big teams and huge capital expenditure like that is seen as a factor in terms of the cost of healthcare. So anything healthcare can do, especially on the provider's side, to reduce costs is a good thing for everyone, including patients.

AI machine learning also has a very strong intersect with blockchain, so one of the things with AI machine learning and training models is there's always this lack of data. If you're running AI machine learning within one organization you've got access to whatever data that organization has in its particular silo of data, but blockchain opens up a possibility of a consortium of healthcare organizations being able to collaborate on blockchain and AI machine learning so they can share data, they can collaborate on training models, and achieve much better models. The data that goes into training models can be tracked from a providence standpoint, it can be filtered out to get the highest quality data, you can have audit information on blockchain so you can unwind and if you have an issue with a particular model, say it's determined to be bias, you can go back and see exactly what data went into training it and route out the data that biased your model, being able to tracks results that come out of a model and the validation of those results across a consortium of healthcare organizations, allows the consortium to learn to trust that model much faster than would be the case of each individual organization [inaudible 00:28:54]. So, there's a strong intersect with AI machine learning and crowd and blockchain.

There's also a strong intersect between AI machine learning and security. A lot of security is about detection and remediation, and one of the things artificial intelligence machine learning can do is monitor network traffic, for example, net flow logs and so forth, and determine anomalies, determine, hey, there's this malware that's on this medical device that's beaconing towards command and control server. That's what we call a weak signal. Essentially maybe on packet on a network that AL machine learning can catch that and say, hey, there's some malware on that medical device, let's get in there and remediate and clean it up. So being able to have AI machine learning watching over the healthcare organization and detecting anomalies, any kind of malware, any kind of hacking attempt, and alert the security team with high confidence so you're not barraging the healthcare security team with too many false positives but just really high quality alerts that are real events, malware or vulnerabilities in the system that need to be remediated.

Vince: You unpacked quite a bit of very exciting information there, so first off, I'm just summarizing here on the AI side, not only taking up billions and billions of dollars at cost, but improving lives, being able to diagnose situations that may not have been diagnosed before?

David Houlding: Absolutely.

Vince:	You talked about blockchain as a democratization, if you will, of the data, so the data could be anonymized and shared more broadly across multiple organizations.
David Houlding:	There are some use cases where data can be de-identified or anonymized, but there's many use cases where that doesn't have to happen. In fact, you may not want to do that, there could be a need to have some, what we call, PII or personally identifiable information fields ... For example, if you're doing a particular healthcare study you may need to know the approximate age of the patient or the zip code that they live in and so you may not always want to anonymize or de-identify the data.
	The other aspect of blockchain is you don't actually have to share the actual data on the blockchain. There may be good privacy security compliance and performance reasons why you don't want do that. Rather, what you can put on the blockchain is meta data about the data.
	For example, say you're going to a doctor's office, you get an x-ray, what can go on the blockchain is, hey, this patient, referenced by a unique identifier, not your Social Security number or something dangerous like that, just a unique identifier for that particular blockchain, this patient went to this facility on this date, got this x-ray, this is the nature of the x-ray, the resolution, what part of the body, et cetera, and here's a pointer to where the actual data exists, so the healthcare organization that has the actual x-ray, and here's a hash code to verify the integrity of the data. That can facilitate the discovery of that data and the location of that data and the subsequent peer-to-peer direct exchange, so not through the blockchain but direct exchange of that data between organizations. So if you go to another provider then, let's say a specialist, and they say, have you had any x-rays lately, and you said yes, there is one, they can go to the blockchain and search and see, oh, there was an x-ray on this date, that looks exactly the kind of x-ray that we need and make a request for that x-ray, not have to do the x-ray again, which adds cost to the healthcare system and inconvenience to the patient, and frankly it's not good to be radiated by x-rays too much.
	Blockchain can really facilitate win-win in terms of, again, enabling that collaboration between healthcare organizations for the benefit of the patient.
Vince:	You mentioned a third area around machine learning and malware, but I think about the ransomware attacks that have happened in the healthcare provider community for the last year or so. I don know, is there's a specific thing you want to talk about there that-
David Houlding:	Sure. Ransomware has been a huge pain point in healthcare, especially healthcare providers, where any disruption to service can be a quality of patient care issue and in some cases, a patient's safety issue. If they have to turn patients away because they haven't got any IT because ransomware has locked up their system, that can be a safety issues depending on the patient's

conditions, so ransomware has just been a huge paint point. When ransomware takes hold in an organization it can leave signatures on the network that AI machine learning can help detect, and one of the things with ransomware if the quicker you catch it, the quicker you can quarantine it and remediate it. So, if ransomware takes hold in a particular subnet of the network of the healthcare organization and it's detected very quickly via a weak signal, like it tried to call its command and control server, and AI machine learning caught that and immediately the security team is on it, they quarantine that network, that machine maybe, and disconnect it so that ransomware can't proliferate through the network. They can radically decrease the impact of that disruption event.

Vince: So, if I'm a customer or a partner looking to engage, why should I consider Azure?

David Houlding: Azure has a very strong presence in the enterprise space, many, many security, privacy compliance features ... It's not just here's infrastructure as a service, have at it. There's deep healthcare domain expertise, blueprints, services that can be used to achieve compliance, to achieve security and privacy, and Azure has a very strong hybrid cloud solution offerings. Many healthcare organizations have some workloads that need run on-prem and some that can run in the Azure cloud, and being able to support both of those with the hybrid cloud from Azure is a great advantage from a healthcare organization standpoint.

Also, healthcare organizations, when they have a business challenge or a business need, they need a solution, a wholistic solution. They don't just need a technology and a project, if you will. They need to understand how to solve their particular challenge or achieve their particular goal, and some of the puzzle pieces of that solution are not technology. So, one of the areas that Microsoft is very strong. as well is in its industry focus, is we literally have thousands of people, including doctors on staff, nurses on staff, worldwide, focused on healthcare that have deep domain expertise and speak healthcare language, understand healthcare trends, healthcare needs, healthcare challenges, et cetera, and they can help the healthcare organizations understand this is all the puzzle pieces you need to solve your need, and here are the puzzle pieces that are technology and here's how Azure can help within that puzzle or that need.

So, it's being able to get that kind of help where it's not just about standing up a VM and have it, and here's a project for you, an IT project, because a lot of healthcare organizations, especially providers, they don't have big IT teams. They don't have many security people on staff, some of them don't even have a chief security officer. So being able to partner with Microsoft around Azure and get the benefit of the that security-privacy compliance expertise, that healthcare domain knowledge, that hybrid cloud, to achieve that whole solution, all the puzzle pieces, again not just the technology ones, is really an advantage to the healthcare organization.

Vince: If I'm a partner, why should I engage with Microsoft in healthcare?

David Houlding:	Yeah. So there's a lot of opportunity for partners as well, a lot of partner solutions are hosted in the Azure cloud, and software as a service for example, there's a lot of partners that collaborate with Microsoft around Azure for security-privacy compliance, or other particular needs, system integration. So there's a lot of interests by the healthcare community in cloud, in Azure, and there's many tasks that need to be done to get healthcare up and running on cloud, and those, to the extent that partners can help accelerate that with high quality affordable services to healthcare, that's to advantage of everyone. So, that's the opportunity. We're very open to working with partners, we love to see solutions running in Azure that are success stories from a healthcare organization standpoint that we can help other healthcare organizations understand here are the cost savings you can get, or here are the new transformative use cases you can achieve with Azure and with cloud.
Vince:	So, if I'm new to healthcare or I want to learn more, where can I go to find out more information?
David Houlding:	Yeah. If you got to Microsoft Health, microsoft.com/health. That's a good resource. There's e-books there, there's healthcare solutions, there's case studies, success stories, information on partners, and blueprints that we've created, and much, much more information about Azure and how to get started. There's the Azure blockchain workbench, which you can access, you can just search on that and get started with blockchain if that's your interest. There's just a ton of information. Also, I'm very active on LinkedIn and Twitter, and if you want to reach out to me there feel free to look at the articles and posts and welcome any feedback. Again, reach out to me if you have any questions or if you want to connect and introduce, and explore synergies and opportunities.
Vince:	So, for those listeners who want to reach out to you or they want to follow the articles you've written, what's the link for that?
David Houlding:	Yeah. The LinkedIn, just search on my name in LinkedIn. Twitter, my handle is just @ and David Houlding, my name, so very straightforward to find me. Maybe we can post some links in the actual text around the podcast.
Vince:	We will do that. We will put direct links to your LinkedIn profile and to your Twitter, @davidhoulding, in the show notes, David.
David Houlding:	Perfect.
Vince:	That's terrific. I want to thank you for taking the time today. This has been a fascinating conversation. Healthcare is so important to all of us and just to see how the technology and the advances that are happening right now are going to

improve things is ... It's very exciting. The future is very bright for us in healthcare.

David Houlding: Absolutely. Thanks very much for the opportunity. Great discussion.

David Starr: Thank you for joining us for this episode of the Microsoft Industry Experience Team podcast, the show that explores how industry experts are transforming businesses with Azure. Visit our team at aka.ms/indxp and don't forget to join us for our next episode.