EPISODE 10: BREWING UP INNOVATION IN THE CLOUD

AUDIO TRANSCRIPT

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Sarah Haywood: Carlsberg is a very traditional company, I mean, we make liquid in a bottle.

Elise: This is Sarah Haywood. She's the CIO at Carlsberg Group, a Danish brewing company that's over 170 years old.

Sarah Haywood: It's a very traditional process. The brewing process sticks to, you know, a heritage approach that has been used for centuries to brew beer.

Josh: But Carlsberg infuses that traditional brewing process...with science. And they do that in this place called the Carlsberg Research Laboratory.

Elise: The lab is in this stately red brick building on a cobblestone street in Copenhagen.

Sarah Haywood: The laboratory, it is run by, by scientists. This is a research facility where we have teams of people working on a hypothesis, a thesis...So exploring ingredients, different types of yeast formulation.

Josh: They're testing hypotheses, publishing research papers, the whole deal. And some seriously important scientific discoveries have happened in that lab. Like, the pH scale

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was invented there in 1909.

Sarah Haywood: The research laboratory has this strong heritage from a scientific standpoint, of really pushing boundaries...

Elise: So inside this magical beer lab, there are these giant stainless steel vats filled with malt, water, and yeast. And all those ingredients get boiled up with hops, then fermented together at a controlled temperature... for a certain amount of time.

Josh: And these variables determine which kind of beer you end up with. More malt means a darker beer. Longer fermentation equals more alcohol, and a potentially drier taste...

Elise: All of this ends up, finally, in a keg at a bar, where you watch the bartender pull a pint and set the glass in front of you: a product of art and science alike. But what if we told you that the beer foaming in front of you wasn't just made with age-old brewing techniques?

Josh: What if we told you that brewing can also happen in "the cloud"?

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Sarah Haywood: Technology is yet

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another vehicle by which as a company we can reinvent ourselves and reimagine the role of Carlsberg in brewing.

Elise: I'm Elise Hu

Josh: And I'm Josh Klein

Elise: And this is Built for Change, a podcast from Accenture.

Josh: So, I feel like a lot of people have misconceptions about what the cloud actually is.

Elise: Well it's because it's called the cloud, right? It sounds like it's something that doesn't exist in physical space that, you know, when you store something in the cloud, it's just stored in air.

Josh: Yeah, like it's in some sort of extra dimensional pocket?

Elise: Yeah.

Josh: Exactly And the term, the cloud is thrown around a lot, not just by consumers, but also in businesses today. And I don't think people really know what that is. I mean, you might automatically think of data storage because that's how it started...

Elise: Yeah, but it's more than just storing my photos, right? The cloud can do a lot of things that power our daily modern lives. It can even make brewing beer faster, more precise and more personalized.

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Josh: And the truth is businesses are under-utilizing cloud technology. So in this episode, we're going to talk about how the cloud has evolved. And we'll talk to a company whose cloud journey has paid dividends – for their business, for their customers, and for the brewers who bring those frosty beverages to life.

Karthik Narain: I don't think there is an official transcript of who named it cloud and what was the reason behind the name cloud, but the story goes, something like this.

Elise: This is Karthik Narain, he leads Accenture Cloud First, where he helps businesses take full advantage of all that cloud can do.

Karthik Narain: When the internet came into existence people represented the internet pictorially by a collection of various computers connected to a network. And that pictorial representation started becoming a cloud.

Elise: Simply put, the early internet was what set us on the path toward what we now know today as the cloud.

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The internet was anything you could access over a network that was not stored on your local hard drive.

Karthik Narain: And with that connection, you could share information between computers.

Elise: But back then, the internet was slow and it was not nearly as easy to access as it is today. So for many people, and businesses, it made more sense to store data locally - either in a file cabinet, or in a digital file on a server in a closet.

Karthik Narain: I think from there, the next biggest jump was in 2006 when storage for enterprise businesses, which was traditionally happening in data centers, was offered as a service.

Elise: Storage as a service. So in the mid-2000s most big companies literally had warehouses full of servers that they either owned or rented to store all of their data. But, by "migrating to the cloud," businesses could move all their data to a cloud provider's storage. They could still access

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it anytime (over the internet), they'd free up physical space in the office and get rid of that clunky server equipment.

Karthik Narain: That was the advent of cloud.

Elise: And - as internet speeds increased and access to the internet became more widespread in the late 2000s and early 2010s, there was another big shift.

Karthik Narain: The beginning of a smartphone era.

Elise: With a smartphone you access the cloud anywhere, any time.

Karthik Narain: These experiences could be accessed not from your offices or from your home computers, but these experiences could be accessed from anywhere on the go.

Elise: And as we used our smartphones for more complicated tasks, that meant we needed bigger, better ways for those services to run. So tech companies started providing more industrial strength in the cloud.

Karthik Narain: They started providing the entire infrastructure stack, which is network and compute and all the other layers of infrastructure as a service.

Elise: In order to play a mobile game

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 online, use a real-time navigation app, or stream a movie, phones can use the cloud. In this case, the cloud can store and process content for you and deliver it right when you need it. Your device doesn't even need to download the file. So if I have my own video streaming business, maybe I create an algorithm that predicts which videos people who use my app might like to watch next. That AI capability is programmed into the cloud, too.

Karthik Narain: Now, from there, we are entering an era where cloud is moving to a cloud continuum where all of those services that we are used to running on a shared central cloud data center can now be available within your own data center as a private cloud.

Elise: Now, a business could basically build out a private cloud and all that comes with it: storage, computing power, network connections… still being run and managed by one of these big cloud providers. Think, like leasing a walled off garden of cloud compute

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 within the larger Eden. So... now that cloud can power things like AI and machine learning, Karthik says companies can totally reinvent themselves. Take the retail shopping experience. The retail store of yesterday would rely on a well-attuned sales associate. Someone who curates the store layout based on what they THINK people will respond to. They need to remember repeat customers, their style and preferences, all in order to deliver a personalized shopping experience and make sales.

But Karthik says, the cloud could process all of this information in REAL-time.

Karthik Narain: That retail store system understands who is shopping at that time. What are the user preferences? What products will sell and what needs promotions and incentives for customers to buy.

Elise: So that data– who is buying what, how much of it, and why, is all stored in the cloud. And the cloud can process that information - and then tell retail associates what recommendations

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to make to customers, what items they need to stock more of, or put on the sale rack.

Karthik Narain: All of that is running on a cloud platform.

Elise: That's everything from basic everyday systems, like keeping track of employee scheduling, to the algorithm that curates that "Mellow Monday" playlist that plays over the store's dressing room speakers. They're all running on the cloud.

Karthik Narain: The cloud continuum is going to be the operating system of the future enterprise.

Elise: So, Karthik says that a lot of businesses take a very cautious approach to the cloud. Nobody likes change, right? So, they'll migrate data a little bit at a time, they'll launch initiatives one by one... But it turns out, when companies take the full leap of faith into the cloud, as opposed to piecemeal changes, they see much bigger gains.

Karthik Narain: They're not realizing the full potential of the cloud because they always had two speeds of their organization. One part that's moving faster, but that part is dependent on the other part,

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which is moving slower.

Elise: It can be hard for companies to grasp how to make the shift from storing to operating in the cloud. It can seem like just one more thing they have to adjust to in today's constantly-changing business environment. On top of it all, a lot of companies are still working with legacy systems which makes that shift even more daunting.

Karthik Narain: These legacy systems are running the business today. It's like asking a ship that is in a, in the middle of the ocean, riding through storm and waves to replace an engine and train the crew to operate that ship all at the same time. It is the feeling that organizations are going through with this cloud transformation.

Elise: The fix? There's no way around it. Karthik says that taking the plunge into the cloud is the only way for companies to remain competitive.

Karthik Narain: If organizations do not make the shift during this era of transformation, they will be left behind and their competitors will take

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market share and redefine the market.

Elise: On the other hand, companies that adopted the cloud quickly, and at scale? They're able to innovate faster. Things like creating personalized recommendation algorithms for their customers, installing IoT applications to predict when hardware would have to be replaced, or building new apps so that business can run smoother and faster for their employees. And here's the thing - even though these seem like big changes, Karthik says, it's all possible *right now*.

Karthik Narain: I think we are in a massive moment of change, for almost all industries. All of this is getting underpinned by the technology evolution that the cloud is bringing. Cloud has the ability to reimagine the health of the society. Cloud will have the ability to reimagine sustainability and how we all need to protect the world that we are living in.

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Josh: What I love about what Karthik was saying is that it points out that once you take all that data you have, and you put it up in the cloud, you can do all kinds of new things with it.

Elise: Yeah

Josh: Like recently I had MP3s that I'd ripped from actual mix tapes.

Elise: Oh my gosh.

Josh: –because I'm super old, but I found that I could dump them into software to automatically identify the songs…

Elise: Cool…

Josh: ...and dump them onto my streaming service. And now I'm sharing those playlists with my old friends from like high school and getting back in touch with all these people.

Elise: That's super cool, but if you're a company, it does seem like it is a lot of work, right? You're trying to make these shifts to move things into the cloud, it might be super hard to implement on a large scale.

Josh: Mmm...It is a lot of work. I agree with that. But as we've learned, it can be done with some discipline, perseverance ... and apparently an awful lot of water, yeast, and hops.

Elise: Exactly Josh. So now we're going to go back to Copenhagen to learn how Carlsberg took the plunge.

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Sarah Haywood: We had out of date operating systems, we had legacy hardware that was running out of maintenance going to need heavy investment to refresh.

Elise: That's Carlsberg's Sarah Haywood again. Before Carlsberg transitioned to fully using the cloud in their business, they were in a bind.

Their operations were still pretty analog, and they couldn't keep up in the market. And it spilled over onto the beer side too. Their low-tech monitoring systems risked spoiling beer, or brewing bad batches.

Sarah Haywood: We had reached a point where we needed to make a decision and, and we probably had two paths we could take, we had a more traditional well-trodden path where we would just take gentle baby steps. Or we could take the leap and really go into the cloud and enable all of the benefits that the cloud actually offers.

Elise: So, Carlsberg prepared to dive in. The plan was to move all of their processes into the cloud: their time management system where employees clocked in and out, their sales platform for tracking inventory and invoicing, even the processes

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that controlled the conveyor belts their beer was bottled on. Everything was moving to the cloud.

Sarah Haywood: There is something to be said about, you know, is this slightly sink or swim? You know, it's hard to learn to swim if you're only paddling, and at some point you have to get in the water and start to swim. With the cloud, I would say there's a similar analogy. There's only so much you can learn about cloud capabilities while you're only dipping your toe in or paddling on the shore.

Elise: So, why do companies stay paddling on the shore? The reason is relatable. Because when you move all of your operations into the cloud, there's a moment when everything – ordering, payroll, brewing – has to stop...

Sarah Haywood: It's a bit of a heart transplant, I suppose. It has to be treated as a project with that level of respect, that level of kind of forward planning and discipline around how you're going to manage it. Because, as we all know, you don't want your patient to die in the process.

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Elise: Much like all of the veins in our human bodies, a company's dated legacy systems are highly complex, interconnected structures.

Sarah Haywood: You kind of cut through the middle of that and lift those servers, those connections, that ecosystem, of technology and you move it into the cloud and in the cloud, it operates slightly differently. You are basically stopping the heartbeat of your company for a period of time before you restart in the cloud.

Elise: Sarah clearly remembers the day that this big migration happened for Carlsberg.

Sarah Haywood: The big migration was for our key Western European markets. So clearly without it, you know, we're not able to fulfill our orders, we're not able to take new orders and we wouldn't be able to take product from our breweries. We secured a window through a weekend to be able to switch all of the systems down and give us time to do all of the steps of the migration.

Elise: The migration would take essentially an entire weekend. Carlsberg technologists were on stand-by for a full 48-hours

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to monitor the move to the cloud. All of those systems we mentioned before? Those applications had to be taken off the internal Carlsberg server and moved into the new cloud server, or spun up as a new cloud-based application.

Sarah Haywood: That early morning where we were trying to make sure that everything came up and that we were confident that we could release the systems back to the business was a very tense period of time. And knowing that there was probably a point in time where we would have to roll back if we couldn't get everything back up and running.

Elise: But Sarah and her team gritted their teeth, and crossed their fingers that their transaction system would work once it was in the cloud. That the bottles on the conveyor belt would start moving again.

Sarah Haywood: The relief when we finally unblocked the system and the first transaction started to flow through and we realized that we were pretty much there and we'd managed to land the plane. It was certainly an experience that I'm not going to forget.

Elise: So - once Carlsberg had safely migrated to the cloud,

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everything changed.

Sarah Haywood: So all of a sudden, it's not one heart anymore. You know, it's an ecosystem that works together to give you that kind of robust infrastructure that you need.

Elise: Now, Carlsberg's customer service team could do things like rely on chat-bots to answer straightforward customer questions using the cloud-enabled power of natural-language processing. That freed-up time for sales associates to focus their brain power on higher-level tasks. But not only did the cloud overhaul all of Carlsberg's infrastructure and technical systems – it gave them the ability to do all sorts of things they couldn't do before, like quickly create an app to market their beer at a football game.

Sarah Haywood: It's opportunities like, you know, connecting with consumers at events, maybe allowing them to vote on who they think is going to win or place bets that might reward them with a voucher or a token that allows them to get a free beer from somewhere or a discount. It's having more flexible technology

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and more agile technology that then, you can customize to a particular scenario to a particular event without having the assets hanging over you in the longer term. And the cost of having bought something that perhaps is only going to be needed for a finite, relatively short period of time.

Elise: And that speed and ease, translates directly to the technical process of brewing beer back at the Carlsberg Research Lab.

Zoran Gojkovic: I come from a country, which you'll get very early interest in beer.

Elise: This is Zoran Gojkovic. He's the Director of Brewing Science and Technology at Carlsberg.

Zoran Gojkovic: I'm educated as a scientist PhD in molecular biology. I'm also brewmaster and daily I work with beer, beer-related beverages, fermentation and technologies. When I talk about science, people start running away, but when you start talking about brewing and especially if you have a few good bottles, then you have a lot of friends.

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Elise: Brewing beer is an age-old process. And Zoran says, before Carlsberg's cloud transformation, their lab monitored the brewing process in an age-old way too.

Zoran Gojkovic: You know, in old times it was the thermometer and your mouth.

Elise: But the process of brewing beer is one that requires fastidious attention to detail-- I mean, Zoran is a PhD in molecular biology, after all.

Zoran Gojkovic: Our challenge is if you really want to make good beer, you have to be careful with a lot of, lot of small things. Devil is in the details.

Elise: Those are details like water quality, oxygen levels, and alcohol content. Especially for a company like Carlsberg that needs to create quality-controlled, identical batches of beer at an industrial scale, monitoring the brewing process to make sure all of those elements are uniform and repeatable requires an assist… from, you guessed it, the cloud.

Zoran Gojkovic: So, there's sensors all over the brewery. There are sensors all over

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production. You measure pressure, you measure, you know, vitality of yeast, you measure alcohol, sugar going down, alcohol up,

pH going down, whatever. All that stuff gets collected. And then you actually have a big set of data, which you then process and you could see actually your performance. You could then go into really nerdy details.

Elise: One of those nerdy details is yeast vitality. Yeast – and the aromas and flavors it creates, from zippy and spicy to bold and heady, it's a vital element in determining the flavor of a beer. And Zoran says, yeast is notoriously fickle.

Zoran Gojkovic: Yeast is a living organism and they're just like us, yeast can have a good day and a bad day. And you cannot really ask, yeast, do you have a headache today? So then, because you cannot ask yeast what he wants, what yeast needs, which mood it is, you have to kind of understand it and then you have to measure. How much sugar would it like, which temperature it prefers.

Elise: And because Carlsberg scientists

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to several months, and that is of course technology plays a big part.

Elise: And besides speeding up beer recipe development, Carlsberg's cloud also makes the brewing process more efficient and repeatable, overall. Those sensors that are monitoring all the little details of the brewing process, like yeast vitality and oxygenation? They feed that data into the cloud, so that Carlsberg brewers can actually predict how a batch of beer will turn out. So if it's not going to be fresh, or the right flavor, Carlsberg can interrupt the process, and start all over again with another batch before they've put too much time and energy into the failing brew.

Zoran Gojkovic: Maybe compare it with driving a car. You start driving, accelerate slowly. You pick up a lot of speed and then if you don't want to drive it into the wall, you will start braking.

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are able to collect all of this data from its sensors in the lab and move it immediately to the cloud, they can get direct, super quick feedback about the "mood" that their yeast is in that day.

Zoran Gojkovic: We have a pretty good control of yeast. We could actually steer a yeast in a direction we want, we could also breed the yeast in a direction we want.

Elise: Being able to steer their yeast means that Carlsberg is actually able to shorten the time it takes to fully develop a particular strain of yeast for a certain flavor of beer. And that means developing and getting beers to market more quickly, even creating completely new flavors from season to season to fit evolving consumer tastes.

Zoran Gojkovic: There is always like a summer Spanish hit. There is always something different every summer. So, you know, if people say I would like a cherry, oh I would like a grapefruit. In old times it was very difficult to have anything ready for that, it takes a long time to develop yeast. You could do it now, instead of years, it's shortened from several years

Elise: In this metaphor, Carlsberg's cloud lets them drive fast. They're able to see a wall coming from miles away, and drive around it.

Zoran Gojkovic: It means, actually what it means is it's a better beer.

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Elise: Moving now from the Carlsberg Research Lab, to the next phase of beer consumption: sidling up to a bar to enjoy a cold beer. Carlsberg has created "draft master" - a cloud-based dispensing system that uses IoT, the internet of things. Here's Sarah Haywood again.

Sarah Haywood: As we're dispensing the beer in a bar, all of this data then is captured by sensors on the equipment. you would know how fast that beer is being dispensed through the lines and through the tap. How much, by volume has been dispensed, you could also have temperature sensors to tell you what temperature the beer was. And then through a gateway is relayed back into the cloud, which allows us then to gather that data at a more, macro level to understand, what trends do we see?

Elise: That data makes it so that Carlsberg can track inventory in real time.

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If a certain kind of beer is selling really well at a bar, they'll see that. They can offer more kegs to the bar so they don't run out of the product their patrons are clamoring for. On top of that, Carlsberg's cloud technology can even make sure the bartender is going to serve you the best pint possible, every time. That's because those IoT sensors we mentioned keep track of metrics like temperature and freshness of the beer inside the keg.

Sarah Haywood: Making sure that for, you know, as you come into the bar, everybody wants that pint of beer to be in the right quality of serve, the right head, the right temperature, knowing that that is fresh and that it's been stored and managed in the right way has a big impact on the taste of your beer.

Elise: So if the beer isn't fresh, or it's flat, your bartender will know that ahead of time and can remedy the issue before they pull you a lackluster pint.

Sarah Haywood: That is going to encourage your consumer to maybe drink another beer or at least walk away feeling that they got a really good pint from that establishment obviously helps them in terms of their footfall, their reputation,

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their ability to attract and retain their consumers.

Elise: So now, from the moment that a keg of Carlsberg beer is ordered, through the process of brewing the beer, delivering it to a bar, and all the way until the bartender pulls the pint and pushes that glass of beer in front of you, every one of those operations are made better by Carlsberg's cloud.

Sarah Haywood: The cloud gives us a very, very agile platform on which we can build then processes, ways of working collaboration tools that help us to cater to all of these very different needs in terms of how people are going to interact with each other in the future.

And ultimately that's what it's all about. It's about people.

THEME

And how people are able to perform at their best and experience life at their best. And in our case, experience their beer at its best. And I think the cloud is a perfect platform to do that on.

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Josh: All right. I do not get to complain about the difficulties in scanning my old mix tapes after hearing what Carlsberg did, because that is so massive.

Elise: Yeah. It really touched every corner of their business and it opened up so many possibilities. Beer is something we may not really think of as using a lot of tech to make.

Josh: Exactly. But now the cloud can make almost any process better.

Elise: Right, obviously, if you can use the cloud to make better beer, the cloud is not just for storing photos anymore. Unlocking cloud technology is totally key for businesses to stay competitive in the future, whether it's enhancing customer experience or making it easier for employees just to log in to work from anywhere in the world.

Josh: Exactly. We're at a moment, like we saw in the case of Carlsberg, where if you don't move into the cloud now, it's going to be really hard to integrate it in the future. And that's going to slow your business down.

Elise: Yeah, and now I want a beer...

Josh: To learn more about the trends in today's episode, check out the cloud continuum report at

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accenture.com/built for change. It talks about more strategies for harnessing the power of the cloud today.

Like establishing critical practices to augment your technologies and the commit to the cloud so that your business can benefit from cloud technology in the future.

Elise: Thanks to Accenture's Karthik Narain.

Josh: And to Sarah Haywood and Zoran Gojkovic for talking to us!

Elise: Built For Change is a podcast from Accenture.

Josh: More episodes are coming soon. Follow, subscribe, and if you like what you hear, leave us a review.

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