Data Center Interview – November 5, 2014 @12:45

INT: Just to give you some basic background on what we’re doing – our client’s interested in basically learning more about how data centers make investment decisions related to the adoption of new technologies and what factors influence the decision process.

R: Okay. Who is the client?

INT: Well, we were hoping to not reveal that information at least at the beginning of the interview to avoid having that affect any of your responses.

R: Can you say whether it’s commercial or government?

INT: It is government, it’s not commercial.

R: Okay.

INT: We can come back to that at the end of the interview, if that’s okay with you.

R: Sure, but I guess I’d like to know a little more about what the plan is going forward. I think I cut you off probably before you were done giving some background. So tell me – I don’t know anything about ABT or GUV, GMAZT. So if you could just fill me in on some of those details, that would be great too.

INT: Yeah, well, it’s an international research and consulting firm and so basically they’re doing this research project on data center investment decisions and the idea would be to ultimately write up and prepare a report with the findings of the study.

R: Okay.

INT: That would then be published, or submitted for publication in an academic journal.

R: Okay.

INT: And so on that same topic, I wanted to make sure you knew that we’re recording the interview today.

R: Okay.

INT: So that in doing the data analysis, the conversation can be transcribed and used for preparing the report and then everything will be captured accurately.

R: Okay.

INT: But your name, no one’s name, no company names, would ever appear in the report or any documents.

R: Yeah, so after the report, the recording will not be shared, or even during the report preparation, right? It’s only for this one report?

INT: Exactly.

R: Okay. Okay. Sounds good.

INT: Okay, great. Do you have any other questions before we get started?

R: Well, I guess ABT is the consultant hired by the government group and you work – or GMAZT is? What is the difference between those two?

INT: Right, yeah, it’s ABT is the consulting group.

R: Okay. So maybe then Beth’s email is at GMAZT, like mine might be at gmail? Is that the idea or does she work –

INT: Yeah, she’s a subcontractor with ABT.

R: Okay, okay.

INT: Okay, and the interview today should last about an hour, I think that’s what I had told you.

R: Okay, sounds good.

INT: Okay, great, well, I just wanted to get started with a few basic questions. Some of these were already covered in our questionnaire, which is very helpful. But can you tell me what your role is in the company with regard to data center management.

R: Sure. Right now my role is I lead a group of data scientists and also a team of sustainability professionals. So my title is leader of applied intelligence, which is our R&D arm of data science, and sustainability.

INT: Okay, thanks. And it sounds from the questionnaire that your company and yourself are involved with five data centers. Is that right?

R: Yeah, that’s right. We’re a co-location data center provider.

INT: Right. And we also had a question about the size of your data center in terms of number of servers. I know some companies keep this information confidential so I’ll just ask the question and you can tell me if you can answer it or not. But the question was whether the total number of servers across all your data centers was less than 2000, 2000 to 10,000, 10,000 to 50,000 or more than 50,000?

R: I’m just doing some quick math. I would – let’s see –

INT: That probably should have been in our questionnaire, so I apologize.

R: No, that’s fine.

INT: For springing anything on you that requires multiplication.

R: [laughter] It’s not a number that I track off the top of my head, being a co-location provider, to some extent we don’t know or keep track of how many servers a customer has so I’m just trying to do it based on square feet. I would say we’re probably in the 50,000 plus category.

INT: Okay, thanks.

R: Yeah.

INT: To also help get us going, my first real question is what are the top three factors you consider when setting up a new data center or doing a major upgrade to an existing data center? An existing upgrade being anything that would involve replacement of a major IT or infrastructure system.

R: Okay, and I think those are – I would probably provide two different answers for a new site versus upgrade.

INT: Okay.

R: New site is primarily due to customer demand, so feeling like there’s a market demand in a region. Consideration number two for I guess, so then there’s a couple ways to slice it. Regional decisions or even local decisions, right? So then I would say a regional decision is more based on customer demand for an area and then local decisions start to come into play, things like real estate price and reliability or level of service that the utility can provide, are probably the next ones for building a new data center.

INT: Okay.

R: For system upgrades or changes, for the most part, our decisions are about increasing capacity so that would be the primary driver, would be a need to increase capacity for customers.

INT: [Uh-huh, indicating yes.]

R: In making those decisions, let’s see – let’s just picture building another system in our data center. So capacity would drive it. Baked into that is a priority that we’re going to have a return on investment for the increase in system size that’s attractive.

INT: Okay.

R: And then number three, would probably be something around timeline and thinking about when exactly to make the decision.

INT: Okay. And where does energy efficiency fit in among factors that you might consider since that’s not something that came to you off the top of your head in terms of the top three factors?

R: Yeah, for system design or system increase, we’ve got energy efficiency in mind throughout. So the systems that we deploy are built in house and so those are – the efficiency choices for designing the system is done separately than the choice to increase system capacity. And for our designers, the energy efficiency and sustainability is one of the top, if not the top design drivers. Security is up there as well and reliability but sustainability and energy efficiency in particular, is a major concern.

INT: [Uh-huh, indicating yes.]

R: For the site level decision, though, we again – it’s back to sort of regional versus local siting decisions. I think region context, we probably would not avoid a continent altogether because we deemed it inefficient, but when it comes to local siting we do take into account the nature of the building so all of our buildings have been repurposed or brownfield sites, so it comes into play in the selection criteria right after the [inaudible due to audio interference 26:40]

INT: Okay, so when you’re – when you’ve selected a new region to operate in, one of your location site criteria would be sustainability and energy criteria?

R: Yes, that’s right.

INT: And you said that all of your facilities are located on brownfields?

R: Yeah.

INT: Okay, so that must have been, it sounds like, is that sort of a company policy?

R: Yeah, I wouldn’t say it’s formalized but it’s definitely the company policy, you know, yes, all of the buildings have been repurposed and we think that’s an important feature of our brand and also an important capability of our data center technology, is to be compatible with brownfield sites.

INT: Okay, so you’re never basically building new buildings from scratch; you’re always refurbishing existing facilities?

R: Right, that’s the case for all five of the data centers we operate right now. The sixth that’s in construction right now in London, the site is an industrial repurposed site but the building itself on that industrial park had to be stood up fresh, so it’s a brownfield industrial park but the building itself is being constructed new.

INT: Oh, okay. This came up in the questionnaire but I had a question about how often you perform major upgrades at your data centers.

R: [Uh-huh, indicating yes.]

INT: It sounds like – do you do server replacements every three to seven years, but you might be making other upgrades at any time?

R: Yeah, so our customers are in charge of the server upgrade decisions so that three to seven is an estimate. They’re in control of that. When it comes to the infrastructure, if a change to the system includes adding capacity, we’re doing that every single month.

INT: Okay.

R: If the change to the system is an investment decision in energy efficiency, or something, that’s a whole other topic. But the way I interpreted that one was how often does the system change.

INT: [Uh-huh, indicating yes.] So you’re constantly adding new, basically IT capacity. What about something like a cooling system or facility, other type of facility type of upgrade?

R: Yeah, so when I say capacity, not just IT capacity, but all of the powering and cooling infrastructure. Our data centers are modular in nature so they’re both in byte size increments, so every time we add a new customer, we have to add power and cooling capacity to the data center.

INT: Okay, so you would be doing that several times a year, potentially?

R: Yeah, as often as customers are bringing in new IT equipment or bringing in infrastructure – to support it.

INT: Okay. So starting from the idea that you want to set up a new data center or upgrade or expand one of your existing data centers, where do you go to gather information about what new equipment or technologies or facility management strategies are available?

R: It’s not really my department but for the technology piece it’s important to know that the company I work for, we design and build much of our own data center technology.

INT: Okay.

R: That is from sub-manufacturers or tier two, tier three manufacturers. But we’re in constant communication with them to incorporate the latest technology into our technology platform.

INT: So you’re not so much looking to outside vendors or you’re saying you would do that to a certain extent and it can be incorporated into your own in house engineering?

R: Yeah, it’s all of the above. For the latest on technology, industry publications, conferences, direct contact, add all of those vendors. At the site level we are really, I guess it’s a bit of both. One, talking to vendors directly for equipment that we buy straight from them, and two, working with our internal technology team to make sure we have the right product that we ourselves make, the right products to match the infrastructure that we’re building up.

INT: Okay. And would your customers ever be involved in that process or be bringing information to the table?

R: Yes, definitely, so we’ve got a few different product lines, for example, our core technology, which is the most resilient and really an enterprise class data center, we’ve got our edge technology, which is for really standalone purposes, if you wanted to put a data center in the desert or in the parking lot, it’s much more of a standalone product, and we’ve got our eco product, which is our best energy efficiency performer, and choosing first among those is largely driven by customer demand.

INT: Okay.

R: And then within that there are different types of technology, just like, you know, after you’ve picked convertible, sports care and SUV, you then might think about the size of the engine and all of those features, that starts to come into play as well.

INT: Okay, interesting. So basically, you would have one of your major data centers in a particular location and a customer comes to you and you can basically sell them one of those three product types at any of your data centers, so they get to sort of customize that.

R: Yeah, that’s right, and the amount of power they need, the level of resilience, the efficiency of the product. There’s a lot to choose from.

INT: Okay, and that process of getting information about potentially new technology or strategies, is that different at all between say your new facility that you’re building in London, versus your existing facilities, or not really?

R: The first thing that comes to mind is there’s a different building code, electrical standards and so forth in the U.K. versus the U.S. or Singapore. So it varies by sites a bit. But I think you’re thinking more about energy efficiency and access to the latest technologies. There’s really no difference whether it’s U.S. or U.K. or Singapore.

INT: [Uh-huh, indicating yes.] Okay, it would all be generally relevant in all locations, if it’s relevant in one.

R: Yeah.

INT: Okay. So I wanted to talk a bit more about that relationship between your company and the client. So who determines when something needs to be upgraded or fixed? Might depend on what it is?

R: It depends a lot.

INT: Okay.

R: For the data centers that we operate, maintenance decisions are made by IO, so by us. Upgrade decisions, it depends on what kind of upgrade we’re talking about, additional capacity, that’s largely a customer decision, if they want to buy more space or power.

INT: [Uh-huh, indicating yes.] What about something like cooling or something that would affect energy usage besides capacity?

R: [Uh-huh, indicating yes.] It’s a bit of both. We could – so customers have the ability to change for example, the temperature setting within their environment or they have the option to change security access or to change the controls on the fans or the number of fans cooling their space for the purposes of energy efficiency. But mostly I would imagine in the real world that happens in conjunction with a discussion with us to talk about what we think is wise to meet their needs.

INT: [Uh-huh, indicating yes.] So why would one customer choose a particular temperature set point and another customer, say in the same location, would choose the different set point, for example?

R: Yeah, for energy saving reasons, typically allowing larger temperature and humidity ranges leads to greater energy efficiency.

INT: [Uh-huh, indicating yes.] So some companies would prioritize energy savings more than others?

R: Yes, and that is in part about financial savings and in part about environmental concerns.

INT: Okay. And on that same note, who would typically pay for the electricity costs, would that be your company or the tenant?

R: The tenant usually pays for the electricity costs.

INT: [Uh-huh, indicating yes.] And is it based on actual measured electricity usage?

R: Yes.

INT: Okay, okay, so they have – basically they are paying all those costs, which is why they would want to be involved in choosing those temperature controls.

R: Right, yeah, and we’ve done that on purpose, the idea is to align incentives between us and the customer so that both parties win when the customer is more efficient.

INT: [Uh-huh, indicating yes.] And has your company been doing that from the get-go or for a while or is that something you shifted to over time?

R: It’s been going on for a while now, the level of measurement and the specificity have gotten better over the past, I’d say it’s been sort of a three year journey to make that better and better over time.

INT: Okay, so in the past was there sort of more limited technological capability to enable tenants to be able to pay actual electricity costs?

R: Yeah, that’s right, and just a different technology platform. So now with the modular technology and all of the data that we capture we can give customer real time feedback into the PUE and inter-performance of their infrastructure and we can tie a bill directly to what they’re consuming and what the efficiency is at the moment they’re consuming it and what the utility rate is at that same time.

INT: Okay, so you don’t have any customers or tenants that would just be paying based on space alone or some sort of blocked power pricing models, at this point?

R: Some prefer that and so some do that.

INT: Oh, okay. So you offer both types of contracts.

R: [Uh-huh, indicating yes.] That’s right.

INT: Okay, it sounds from what you’re saying – see if I’m interpreting this correctly, that most of your clients are now using the actual electricity cost model though. Is that right?

R: Yeah.

INT: Okay. Is the data center or your organization run as a single organization with one budget and one team or are there different silos, sort of different departments with separate budgets, separate teams, making separate decisions?

R: Well, let’s see, we’ve got a very large company so we of course have different departments – HR, engineering, software, the team I run, operations. I think part of the question is around the breakdown in the data center world by when you have silo decision making, especially when it comes to facilities and IT.

INT: Yeah, that’s probably something we’re interested in.

R: Yeah. As a co-location provider, we will always be siloed from the IT decisions of the customer. So in some ways there’s no way to overcome that barrier. The way we try to do that is with information and incentives, so providing all of that real-time data and aligning billing incentives to enable us and customers to make optimal decisions. Within the company and what we control, we take a very holistic view towards investment decisions or system upgrade decisions, system design decisions, such that it’s not just one budget or one silo achieving a local outcome at the expense of some global optimal.

INT: Okay, okay. I don’t know if you’ll be able to answer this question or not but for your clients, do you have a sense if within their companies, is it the same division that’s paying the electricity cost as the team that’s making the decisions about IT and capacity and such?

R: I could speculate, but it would also absolutely come down to it depends with so many customers. I could say that the way we’ve positioned our technology and our brand and the way we talk about and think about data centers as a system to be optimized, it attracts customers who are not thinking about the status quo data center design, who recognize that the system as it has been done is broken and that are thinking more holistically about data centers. So of course, it depends with so many customers, but on the whole, I would think that some of our major customers and for us the fraction of customers who do think about things in that more forward thinking way is probably higher than you might find elsewhere.

INT: Okay. On a different tack, does your company either buy or sell used or refurbished equipment for the data centers?

R: Yeah, let me think. [pause] So in some of our sites, seeing as they were brownfield, we bought existing and used equipment for the infrastructure.

INT: Okay.

R: So that’s a yes. For selling used equipment, it’s something that we think and talk about a lot, the end of life of our products, and the first fact is we’re still a young company so a lot of our infrastructure has not reached end of life yet.

INT: Okay.

R: So we haven’t really crossed that bridge but it is something that we think about and talk about a lot.

INT: Okay. So in terms of decisions of how investments have been made so far, the end of life of those products probably hasn’t been a big factor, deciding what to go with so far.

R: Well, the way we design and build our technology is very much with the end of life in mind but I don’t think we’ve sold any used technology yet.

INT: [Uh-huh, indicating yes.] Okay. And so equipment that you may have purchased to use for infrastructure, that would be things like essentially lighting, HVAC.

R: Yeah, lighting, HVAC, chiller plants, to some extent utility or yeah, power infrastructure, transformers, switch gear, that sort of thing.

INT: Okay. And would you assess that type of equipment in terms of performance, energy efficiency, et cetera, sort of in the same way that you would new equipment?

R: Yes, and no. It’s a slightly different economic decision, which includes energy efficiency, of course. The existing equipment has to be efficient enough and reliable enough for us to feel it fits within our data center design philosophy.

INT: [Uh-huh, indicating yes.]

R: But you know, it’s just a very different decision to look at than buying new.

INT: Okay, so you would have sort of you know, minimum performance standards on energy and other aspects of performance and you’re not going to be below that.

R: Yeah, that’s right.

INT: Okay. So continuing on the energy efficient tack, I wanted to ask – it sounds like you’re doing expansions and upgrades all the time but have you recently made any major investments that focused on improving facility energy efficiency?

R: Yeah, so there’s a few things. We’ve done a good amount of air flow management research and investment recently to get our cooling infrastructure more efficient. Our – we also have the eco products that I mentioned recently, a minute ago, is a recent development over the past couple of years, a significant investment to create a free air system and so that’s probably the biggest investment in energy efficiency that we’ve made.

INT: Okay, so that’s sort of like a whole building or a whole module design issue?

R: Yeah, it’s again a modular design. The systems that we’ve deployed are definitely building sized but are housed within our data centers.

INT: [Uh-huh, indicating yes.] And can you expand about what makes that particular eco product or aspects of it appealing or why you invested in that approach?

R: Sure. Should I go into the benefits of free air or adiabatic cooling for a minute?

INT: Sure.

R: Okay. So historically data centers were in closets and because they were in closets most IT equipment had to be at the same temperature and humidity that we design an office building to, right – 72-73 degrees, 50% humidity. Over time and certainly this is an IO vision, that data centers don’t need to be buildings but they certainly are the size of buildings and so some of the same design requirements that we may have had for an office building is no longer relevant if that building is 90% full of servers. The industry has also moved in that direction and ASHRAE, the American Society of Heating and Refrigeration and Air Conditioning Engineers, released expanded operating ranges, what they call PC9.9, a technical committee. The expanded operating ranges allow for much larger temperature in operation and much larger humidity ranges in operation. So that’s a little bit of background, part of the enabling of what in the industry has been much more a focus on free air cooling, so the idea is bring air through once and rather than cycling it within the data center. To do that, you have to design systems that can take air whatever condition it might be outside and bring it into an applicable operating range, so that could mean humidifying, dehumidifying, heating or cooling or any combination of those. Some of those are easier to do than others. Heating for example, because we’ve got a lot of heat generated in the data center, it’s not really a problem to heat incoming air, we just need to route some of the air that’s leaving past the air that’s coming in and we can exchange heat that way. Humidification, you know, you add moisture to the air; dehumidification is a little tricky, but there’s a whole bunch of ways to do that. What we designed is a system that can take into account the conditions inside the data center and the conditions outside of the data center and make adjustments to how the system is performing to create the right kind of incoming air conditions. The benefit is that for a lot of the year, and it depends on region and on how tightly the operating ranges are, for a good portion of the year, you can operate without mechanical cooling, so you don’t need power chillers to create chilled water or anything like that. So you end up with PUE, power usage effectiveness reductions because you don’t need to have mechanical cooling operating for all of the year.

INT: Okay. And so you would have, based on your modular approach, you would have some clients using the free air system in the same facility as other clients who are using a more traditional cooling system?

R: Yeah, that’s right.

INT: Okay. And so I guess, how did you roll out this technology? Was it something that you just tried out in a few instances or with a few clients first?

R: Yeah, we have a large and close customer who asked for something of this nature and we co-developed it with them. So that was a very good way to drive the R&D effort forward and now we have a product that we offer and have sold to other customers as well.

INT: Okay. And so I guess I also wanted to ask if you had made other major investments in energy efficiency on the server utilization side as well?

R: There’s an – I’ll have to introduce a new nuance so we also have – we take our same technology platform and operate cloud services on top of that.

INT: [Uh-huh, indicating yes.]

R: So it’s those cloud services where we have control over server utilization.

INT: Okay.

R: So for that portion of our business we very much work on utilization and optimization of server, but for most customers, we are not in control of server utilization.

INT: Okay.

R: So what we offer instead is visibility into server utilization, visibility into energy prices, visibility into the energy efficiency of the system to try to enable them to make better decisions, because absolutely poor server utilization, or really poor utilization of all things in the data center is one of the biggest drivers of energy inefficiency right now and economic inefficiency. It’s very much on the scale of how poorly utilized our vehicles are, right? All of them are parked outside right now, and for those that are driving, there’s one person for every five seats actually being transported around. And so it’s very similar in the data center, so where we have control we’re packing the car full and carpooling, where customers have control, we’re trying to show them metrics that allow them to make better decisions.

INT: Okay. So they’re making the decisions but you would be working with them in terms of providing them with that information. You actually do some measurement or provide them with some metrics on equipment utilization?

R: Yeah, that’s right.

INT: Okay. And do your customers – this might be related – do your customers tend to use all the energy efficiency technologies that are built into the servers or do they sometimes turn those features off?

R: I don’t know.

INT: Okay. And it sounds like because of your business model being a KOLO, that’s the facility energy efficiency and the IT utilization decisions are made somewhat separately?

R: Yeah, I mean, they’re made at two different companies.

INT: Right, okay.

R: I mean, again where we operate our own servers, and we do have some of that, we think about it holistically.

INT: Okay. And are there any energy efficiency technologies that you’ve chosen not to pursue at this time?

R: Yeah, that’s a loaded question. I mean, perpetual – we haven’t looked at perpetual motion machines and we haven’t put a nuclear reactor in the data center.

INT: Well, fair enough. And anything that sort of you’ve thought about seriously but have decided not to do it yet or not to do it at all?

R: I hope we think about everything and evaluate everything equally. We explored direct current versus alternating current a few years ago and it didn’t take off, I don’t think the market demand is there yet for that, if ever. But we built a module that was direct current and I think there are many in the industry who think there are clear energy efficiency gains from doing that.

INT: Okay.

R: Yeah.

INT: I saw on the questionnaire that you filled out, you checked you know, that you use all of the strategies that we listed. So I guess I’m not that surprised that you didn’t have anything that you’re not doing.

R: Yeah, like I say, a lot of the ones that have been proven to make sense, we do.

INT: [Uh-huh, indicating yes.] Right.

R: And where we don’t have control to implement them, we try to think creatively about enabling our customers to make economically rational decisions to do that.

INT: Right.

R: And where there are others that are emerging but not yet on that list, for example, I hope that we’re always open to new suggestions and we’ve got a factory where we’re making modules and testing them and tinkering, and so you know, we’ve got the opportunity and we do test anything we can get our hands on to see if it’ll make a difference.

INT: Okay. I guess I have a list of factors that I wanted to know how they may or may not come into play in terms of thinking about energy efficiency. So you see a tradeoff between performance and energy efficiency and does that affect the decision making process?

R: Well, it depends on what you mean by performance, which is – you know, energy efficiency is clear, or clearer. Performance could mean, how secure is the system? Performance could mean how reliable is it, how quickly does it accomplish a task, what’s the latency between here and a customer. So I would say, you know, the politician answer I suppose – and it’s true – if you prioritize any one thing, you might end up having to sacrifice other things, right? We could make it more and more efficient at the expense of security, reliability, latency and even cost performance. So everything is about balance. The nice thing in the data center world is there’s a lot of energy expense out there and a lot of energy inefficiency expense out there and so a lot of the – I guess in that balance there’s a lot of weight behind energy efficiency.

INT: Okay, so it sounds like there’s not much of a tradeoff sort of up to a certain point, and then once you get beyond a level of high performance then there might be tradeoffs among kind of all facets of performance?

R: Yeah, I think.

INT: What about climate or location specific factors? I mean, you mentioned kind of regional and local factors coming into play. Does – is climate one of those factors?

R: Yeah. So cooler climates lead to greater efficiency of the data centers so that’s a consideration always. But in the scheme of things, the heat generated within the data center far outstrips the heat that might come in through the envelope, for example. Now, what a hotter climate does is it makes it more difficult to run those eco modules or hurts the efficiency of the cooling towers. [coughing] Hold on, let me get a glass of water. Sorry, I’ve got a tickle in my throat. One second.

INT: Oh, sure.

[pause]

R: Sorry about that.

INT: Oh, no problem.

R: I guess that’s why you see people on stage with a glass of water, right?

INT: Right.

R: Talking for 45 minutes can do that to you. So climate is definitely a consideration. So temperature and humidity of the climate have impact on energy performance of our systems, so we try to site in cool climates. The other regional things that come into play are you know, energy mix and level of renewable energy available on the grid, the type of utility structure, the price of energy, the risk of natural disasters, yeah. So all sorts of things come into that, the siting criteria.

INT: And so are some of those location factors, do those help drive your client’s adoption of the eco module? Do you see kind of more adoption in certain locations with a certain type of climate or with certain types of policies or zoning?

R: I think it’s more cultural.

INT: Okay.

R: Yeah, yeah, I feel it’s more cultural and that could be either the country culture or even the corporate culture.

INT: Okay.

R: I wouldn’t say across the board you know, people in hot climates are more interested in energy efficiency, right? It’s more like you know, in Singapore you have a culture that’s very focused on resource efficiency because there are not many natural resources in the country, and they also happen to have a very hot and humid climate. But I think it’s more about the culture of resources than it is that it’s hot and humid there.

INT: Right, okay. What about financing opportunities for new technologies? Does that affect adoption of different energy efficient technologies, like utility incentives, or anything like that?

R: So we work with utilities for rebates on our technologies that we purchase and that certainly helps and we get a very healthy amount of rebates for each site for each year for making good investment decisions. We also directly invest in energy efficiency quite a lot between our R&D work and our new product design and opting for more efficient, not just components, but also architecting more efficient systems overall with controls and geometry, I suppose even, just the modular technology.

INT: [Uh-huh, indicating yes.]

R: And so I think we’re progressive in our energy – in evaluating energy efficiency opportunities and where there are incentives like from the utility, we definitely go after those.

INT: [Uh-huh, indicating yes.] Are you able to negotiate electricity rates with the utilities based on your investment in some of these energy saving technologies?

R: Usually the rate is not negotiable but the rebate takes into account the efficiency. And then so most utilities are structured so that if you want to get credit for being efficient, you look at rebates, not a new rate. But it varies from utility to utility and we’ve got healthy dialogues with each of them and in some places we work to find as creative a solution as we can, so it varies.

INT: Okay, and are there any tradeoff issues? We were talking about potential tradeoff between energy efficiency and performance. What about sort of maintenance or installation, those kind of issues?

R: Tradeoffs with energy efficiency?

INT: Yeah.

R: Let’s think. I don’t think across the board you could say that higher efficient products require higher maintenance. You could make an argument both ways and you know, you could say that the more efficient it is, the less infrastructure and upkeep you need because it’s just more elegantly designed and requires less cooling and less power and all of that. You could also make the argument that efficient technologies especially at the forefront are newer and emerging, right? LEDs probably have more issues than incandescent light bulbs because one has been around for a hundred years.

INT: Right.

R: For us, all of our lights in the modules are LEDs with occupancy sensors, it’s a choice that we made that we feel very comfortable with. As one example, we don’t have any maintenance issues with going forward with that technology even years ago.

INT: [Uh-huh, indicating yes.] You talked about how you do a lot of your own in house engineering and that’s how you get information about sort of developing new technologies and strategies. Are you guys able to estimate pretty reliably what the reduction in energy usage would be from adopting say the free air system?

R: Yeah, yeah, I would say yes, and partly I’m biased. [coughing] Excuse me.

INT: You okay?

R: Yeah.

INT: Take another water break.

R: Every hundred words or so. I’m biased, part of that analysis comes out of this group and I think we do a pretty good job. The biggest, you know, these are complex systems but they’re not, I guess you could say there’s a known answer, right? They’re big but you can model them.

INT: [Uh-huh, indicating yes.]

R: You know, no model is ever going to be exactly right but you can definitely quickly get to a place where you can be comfortable with the sort of payback, the sort of energy savings. I’d say the most difficult things to model are customer behavior and how much they’re going to use a piece of infrastructure, or if they don’t use it much, the efficiency is bad.

INT: Okay.

R: And that’s the problem with the – the biggest source of inefficiency in our systems is customers that just don’t use as much as they have. And you know, just like a bus driving around with only one passenger in it, you know, it’s – on a passenger mile per gallon basis, it’s just far less efficient than if you had a hundred people on there.

INT: Right.

R: Same for the modules, you know, we design the bus, the module, to be as efficient as we can and we try to align incentives and give information, but it’s – at the end of the day it’s up to the customer to decide how much to load it up and they may have totally rational decisions for keeping an entire data center dark because it’s for backup purposes, but that’s going to hurt overall energy efficiency. So you know, that’s the toughest bit to model and so we need to think about all the different customer scenarios when we’re designing our product, they can’t just be efficient at a hundred percent usage, they need to be efficient at low usage also. And same for any technology we’re evaluating, so not just the module design but whether to put in a new chiller plant or whether to put in an economizer. It has to do with what the usage is going to be and that’s probably the biggest question mark. It shows up when we’re making the investment, shows up when we’re applying for rebates but the good thing is we’ve got a lot of data to support what we think the expected customer usage is going to be and so we make good models about what we expect and they’ve served us really well.

INT: Okay, so would you typically – would one of the factors that you would use to assess one of these investments be to weigh the upfront cost against the energy savings, develop kind of payback calculations?

R: Yeah, that’s definitely one tool.

INT: Okay, and is that also the kind of information you would present to your clients to help them assess whether to take over the eco module versus one of the other modules?

R: Yes, yes, that’s right.

INT: So do you kind of sell that or you know, do you, I guess, view to your customers the eco module as having an improved payback over the other types of modules because of the energy savings?

R: Yes, and we also think about our technology versus traditional data center as having a very good payback. We did a study with one of our utilities a little while ago that showed a 44 percent reduction in energy overhead so the portion of PUE above one, from switching from traditional data center to our modular platform. And that’s an economic argument that we ourselves, you know, it’s a reflection of the economic decision that we made to invest in that new technology, but it’s also the backbone of future analysis toward, you know, for internal decisions and also for working with customers to explain the benefits of going with a new technology.

INT: Okay, and so do you see your clients then, the ones who tend to use their servers more intensively, are they more likely to invest in those types of systems?

R: I’d have to say yes, you know, but that’s not even so much about our customers as it is if you’re going to use an energy efficient light bulb a lot, it makes more sense to buy it than if you’re never going use it, you know, so that’s just generally true and definitely we’ve got customers across the board who agree with our design philosophy, the energy benefit, the security benefit, reliability benefit, and whether they use it a lot or not, you know, the customers that seek us out and are excited by our technology have a sustainability and energy efficiency mindset you know, and sort of get the vision.

INT: [Uh-huh, indicating yes.] And would you also present your clients with metrics like kind of cost per amount of time or revenues per compute cycles, or any metrics like that?

R: Yeah. You have to normalize these things somehow and so doing it on a square foot basis doesn’t really make that much sense. Doing it on a cabinet by cabinet basis or server by server basis, doesn’t always make sense. During it per KW or KWH consumed is usually a good way to think about energy efficiency benchmarking, you know, thinking about the energy itself as the normalizer. And as you move closer and closer to the IT gear, right, so consumed energy at the IT or the amount of servers that can be run of a certain type off of this, you start to get a more meaningful metrics, I think, you know, than sometimes – I guess I should take that back, you sort of use the right metric for the right job, but I would also say overall metrics that are more holistic and in this case, that would be closer to what data center needs to do, the better.

INT: Okay. So this is sort of on the same line of questioning as looking at paybacks or return on investments. Some companies in other industries besides data centers have generally told us the payback period they look for to justify an investment in energy saving technology, would generally be substantially less than the lifetime of the product, so for instance they’re looking for a payback of one to three years, but the equipment lasts ten years.

R: Right.

INT: So I was wondering if that was also true in your company or with your clients?

R: I think that’s true about every industry, right. So that’s a major breakdown in the building sector, is a building lasts for a hundred years and someone somewhere is making a decision about what air conditioning to put into it and I guarantee they’re not thinking about a hundred year payback. You know, it speaks to alignment of incentives and also includes ideas about time value of money and needing to discount future cash flows and I think payback period does not usually include discounted cash flow and so that’s one of the major reasons why I think it can appear like there’s this discrepancy between the payback period that I want and the useful life of the equipment, but at least part of the fault is that’s their simple way of calculating the economics of the decision.

INT: Right, yeah, if you do a payback with no discounting, that wouldn’t necessarily reflect the actual return on investment.

R: Right, and yeah, conversely if you did one with discounting you might find that the one to three year payback threshold in simple terms for an asset that’s going to last ten years is actually a good rule of thumb, right? I don’t know, but you could find all sorts of different things.

INT: Is there a specific decision rule within your company along those lines?

R: No. Yeah, I guess, yes. An investment decision needs to make good sense, right? And you know, not all –

INT: Not all so reasonable.

R: Yeah, and I guess I purposefully did not say economic sense because sometimes you make good sense for benefits to brand or benefits to acquiring a new customer or some other more external benefits, all of which you could internalize somehow in a cost model, but you know, that would be an even more complex version of the financial analysis. For us, it’s got to make sense and for most simple energy efficiency investment opportunities in the data center world they make a lot of sense and so that’s why you see we’ve given the survey for a lot of these almost no brainer technologies, we’ve gone after them and we think it’s been a good decision.

INT: [Uh-huh, indicating yes.] So you know, I guess I would say – did you run those kind of numbers on these technologies and they kind of all looked good and that helped motivate the decision, even though there were other factors that came into play? Or was it more quality?

R: I guess for some yes, and for some no. But I think for a lot of them, no. A lot of them may be on the back of an envelope, many of them have very attractive – better air flow containment is an extremely attractive thing. I can’t believe people are not all doing it, but nobody needs to write another white paper on the benefits of air flow and the payback. It has been proven to be an extremely economically rational decision.

INT: Okay. So looking at that list of technology that you checked off on the questionnaire, on the facility management side, I mean, for all categories you checked everything. But would it be fair to interpret that you’re using all of these at all of your – all five data centers – you kind of adopted them widely?

R: I’m pulling up the sheet now. I do have to stop here. I can go a few more minutes, but if we need to reschedule, I’m happy to do that, but I do have another meeting coming up right now.

INT: Oh, sure.

R: So give me an example, I don’t have the questionnaire in front of me; I’m pulling it up as we speak. So you said operational decisions versus technology decisions, is that right?

INT: Yeah, sort of facility management decisions like on the cooling, lighting, air flow management side.

R: Yeah, they’re universal.

INT: Okay, that’s pretty universal, because then on the server, sort of IT side, it sounded like there might be more heterogeneity because some of your clients are adopting some of these things and some aren’t.

R: Yeah, and that would be heterogeneity within a site; we have many customers in each site, so even that would be true if we were thinking site by site, it would all be universal as well.

INT: Okay. Well, that’s basically it for our questionnaire and I know you said you have to get to another appointment as well. So I really want to thank you for your time and also make sure to follow-up with you on any other questions you had. I know, you asked about the client for the survey.

R: Yeah, so can you tell me now?

INT: Yeah, it’s the Environmental Protection Agency.

R: Okay.

INT: Was there anything else? Any last questions or comments?

R: I’d be interested in learning more about what they’re hoping to do with this. I know I’m a confidential contributor here but if there are ways we can work with them more collaboratively or if they want to follow up in a non-anonymous way and have a conversation about what they’re thinking about doing or releasing, I’m up for that. So just let me know.

INT: Okay, thanks. I’ll make a note of that. I really appreciate your time. This has been incredibly helpful.

R: Great, thank you, Heather.

INT: Thank you, Patrick. Bye.

R: Bye.

[END OF INTERVIEW]