Data Center Interview – December 4, 2014 @14:02

INT: I can tell a little bit about your company based on your questionnaire, but maybe to start off you could just tell me generally what kind of data centers your company operates and what industries you serve, and your role in the company.

R: So I’m director of sustainability. When you say what kinds of data centers, I guess let me start with sort of the sector we’re in. We’re an Internet company, provide Internet services to consumers and basically provide an advertising platform for companies and non-profits and others.

INT: And you say you’re the director of sustainability. So what is that? Do you have a one-minute description of what that entails?

R: Yeah. I and my team are responsible for understanding what our particularly environmental footprint, though we work on other sustainability issues, are, as well. So across the board energy, greenhouse gases, waste, water, materials, toxics, and so on. What’s our footprint? What is the contributors, and what are the major things we can do to reduce it? And we work with teams across the company to - - on all of that, including identifying projects where we can reduce our footprint.

INT: So do you actually make purchase and management decisions, or do you sort of advise the folks who make the facility or IT decisions?

R: Yeah. I make some, but most of those are made by other teams with a lot of input from me and my team.

INT: So hopefully you can still kind of tell us how - - let’s say your company is in the process of setting up a new data center or doing a major upgrade to an existing data center that might involve the replacement of a major IT system or a building infrastructure type system. Can you give - - just off the top of your head, what would be the top three factors that are considered when approaching that decision-making process? They don’t have to be ranked necessarily. Just what are the things that come to your head?

R: There are dozens of factors certainly. If I think about particularly an existing facility where we’re talking about an upgrade or refresh of equipment and so on, we’re going to look - - energy efficiency is very high on the list. Environmental impact, sort of ranking the relative environmental impacts of different possible solutions if we’re - - typically would consider a number of alternatives. And energy and water are the two biggest issues there we also look at. Materials issues, we’re trying to drive toxics out of both the facility itself, the building, and the mechanical equipment, as well as all the IT equipment inside of it. So that’s a big push over the next few years.

But energy efficiency and water consumption are very high on the list. And cost. And when I say cost, I mean total cost of ownership. So it’s not just acquisition costs or capital costs. It’s looking at the life-cycle cost.

INT: And would you say these area also the top factors for the other teams that are involved in this decision-making process? I would imagine they’re definitely the top for your team on sustainability and environmental footprint.

R: Yeah. No, I would say - -

INT: The other folks you interact with, is this just one little input, or would they also rank energy efficiency very high?

R: They would put energy efficiency very high. They might put environmental impact a little lower than I would, but I make sure it stays near the top, and they agree it should be near the top. I would probably personally put it a little bit higher.

INT: Right.

R: But as the company, I would say those are the top factors. We also - - and when I say total cost, we include in that the acquisition cost. We include the sort of obvious operational costs like cost of energy, cost of maintenance as we have to replace parts over time and so on. But also when I think about the job of actually running a facility, we’ve worked really hard to design and build our facilities and our servers and everything about how we put the whole thing together so that maintenance is as easy as possible.

So when we’re looking at equipment that we might purchase, one of the things we ask is, is this something that is going to be easy - - when there is maintenance required, it’s going to be easy for the server techs of data center’s support staff to maintain it. And there are - - there’s equipment out there that might be really efficient but is designed in a way where replacing anything is a royal pain. And so we work really hard to make sure that all those kinds of jobs can be done sort of easily and efficiently.

INT: Yeah. We’ll get into some of that, I’m sure, more later on and the whole maintenance, energy efficiency perhaps trade-off. I noticed on your sheet, you say you don’t disclose exactly how often you replace servers or make major infrastructure upgrades. If you can’t give me a ballpark on that, can you tell me if you have a set cycle for doing a major upgrade or a refresh, or do you just do it when something breaks? Can you tell me anything?

R: Well, so servers, I think if you wanted to say approximately every three years, that would be fine. It varies depending on the server type and the pace of change in sort of server performance improvement and so on. But approximately every three years is a good rough estimate. In terms of the data center itself is more a matter of - -

INT: The facility itself?

R: - - obviously when things break, then we look to - - we fix them, and we look at what’s available out there to see if we want to make any kind of major upgrade or change in that process, or if it’s just a matter of let’s fix what broke. We designed our data centers to be extremely efficient. So when we’re looking to do upgrades, it’s really about are we going to - - we do consider them periodically. In fact, we’re in the middle of looking at some upgrades to electrical infrastructure right now.

And it’s a question of how will it - - what’s the benefit? Will is save energy? Will it save money? Will it simplify, make the job of the operational teams easier? And then what’s the cost? So we periodically go through an evaluation of about things we’ve known about for a while, but also new things that come across our desk to see if it makes sense to do something like that. So that’s probably on a - - I’d say on a 12- to 18-month cycle when we kind of consider those kinds of things. We don’t do major upgrades very often. But we ask the question fairly regularly.

INT: You mentioned you have six major sites. Is a site like a data center, or can you have several centers on one site?

R: Each site has several buildings.

INT: Several buildings. And are - - can you tell me the average age of them or -- ?

R: So we have a couple of - - we have a couple of co-location facilities, and those are - - the buildings themselves, I think, are 10 or 15 years old probably. I actually don’t know exactly. We’ve been in them for between five and ten years depending on which building. And then the ones that we have built ourselves, the other four, one of them is about five-years-old, one three, one two, and one just opened.

INT: So relatively new.

R: The others - -

INT: So starting from the idea that you would want to build a new data center, upgrade existing one, how do you generally gather information about what new equipment or technologies or facility management strategies are available when you approach this question? Where’s your main go-to source for information about new out there?

R: So we have a team of people of engineers and architects for that matter, but who - -

INT: An in-house team?

R: In-house team, small in-house team. Total, when you take the engineers and other people involved in data center design and development, it’s probably about a dozen technical people in-house. We rely on some external contracting firms who provide design help on those things, and they - - they provide up with a lot of input. I think our technical folks are very plugged in to what’s going on out there. They attend a lot of the major conferences, the major vendors certainly, and many smaller vendors reach out to us regularly trying to pitch us on things.

So we’re pretty aware of what’s out there, and we rely on what we learn from conferences, from people reaching out to us, and from our - - the contract vendors we use to support our designs to make sure that we identify the things we ought to be looking at.

INT: Do you conduct in-house testing of things, as well?

R: Yeah. We have some lab space where we experiment with new things. When I say lab, I mean a big kind of warehouse space where we can experiment with not just a rack of equipment but with different ways of, for example, constructing the data center. One of the things in terms of as we do new builds that we think about a lot is how can we reduce the time from deciding we need a certain amount of capacity to when we have it online?

And that - - so we’ve been looking a lot at modular construction techniques, if you will, so that more of the work is done essentially in a manufacturing context in a factory and that the on-site stuff is more assembly rather than kind of stick-built construction. And we’ve done a lot of experimentation around that in our labs.

INT: And how about other data center companies like yourselves, is there much peer interaction there or comparing notes on what technologies are proving to be effective or not, or does that --

R: Quite a bit.

INT: - - in your industry?

R: Yeah. We - - as I said, we regularly attend the major conferences, whether it’s 7x24 or the Green Grid or the Uptime Institute’s forums or the - - we’re an active participant in the Open Compute project which is, I think, some of the most open sharing that’s going on, where the participants are basically open sourcing their - - where they’ve developed technology, they open source it and make all the details available and talk a lot very frankly about the positive and negative experiences, so we can all learn from each other. So I think that’s been very - -

INT: That’s great.

R: We’ve been very active in all of that, and a number of other companies have, as well. There certainly are some big data center companies that are much more closed and aren’t really willing to disclose much in the way of details about what they’re doing. But we have and a number of others do.

INT: I think you noted on your questionnaire that you lease some facility space or also equipment from other companies; is that correct?

R: Correct.

INT: And what is that relationship like? Do you pay based on just the space alone in terms of racks or square footage, or do they charge you based on other factors like power use?

R: It’s primarily - - it’s a square footage plus power, and power is the dominant factor.

INT: And does the facility owner determine when major power, cooling, infrastructure systems need to be fixed or upgraded, or do you guys have any say in that or give them any direction?

R: Yeah. Basically, we - - the facility owner may own - - runs the facility which includes HVAC and all the power delivery into the server room. And then we own the - - basically from the power bus to the racks. And so at the same time, we’re in - - in most of the places we’re in, we’re a fairly substantial - - or at least the two big ones, we’re a very substantial customer. So when there are issues, we’re in close contact with them, and we have worked very closely with them around efficiency upgrades, improvements. We did the cooling infrastructure over the years.

INT: Great. And on the flip side, do you lease data center equipment or space to other companies?

R: No, we don’t.

INT: Your locations? You don’t?

R: No.

INT: And where you lease space, who pays for the electricity costs?

R: We do.

INT: You do?

R: Yeah.

INT: And - - sorry. I’m just trying to skip ahead to make sure I have time to cover everything. And how would you describe how your data center is run in terms of the organization? Does it have one budget, one team, or do you have a lot of silos with separate budgets and teams and bosses? So is the IT department responsible for electricity costs at all, or are they very separate from the facility management department as opposed to -- ?

R: It’s really one team. It’s managed in a very integrated way. Obviously, it’s a big team so there are subgroups. But it’s not - - I’ve seen companies where it’s very siloed and you’ve got the IT department that manages the servers and has the budget for those. And you’ve got the data center facilities group and often our real estate group more or less that deals with that. And ours are much more integrated and dealt with in a kind of holistic way.

INT: So the IT department is responsible for electricity costs or electricity usage consequences of their decision?

R: We basically have one organization which is global infrastructure, and there’s a team that’s’ responsible for designing and building the actual data centers. There’s a team that’s responsible for managing the facilities, in other words the buildings and the HVAC and so on. And there’s a team that’s responsible for installing and managing the servers. The budgeting and payment is - - each of those teams has a budget, but that’s all managed by and coordinated by one central group within that whole organization.

INT: Switching a little bit, do you all buy or sell any equipment on the secondary market, or is there anything related to your data center that you participate in the secondary market for?

R: You mean other than - - so not new equipment - -

INT: Right.

R: - - is what you’re saying?

INT: Yes.

R: So we - - I don’t think we buy much of anything that’s not new. I honestly am not sure. For example, with things like generators, it’s possible that in some cases when we’ve been building a facility, that we’ve bought some used gen sets because they’re available and a lot cheaper, and they were in good shape. But I don’t think so. Servers are new. Most of the equipment certainly is new.

We do - - when we are done with equipment, if it has useful life left, then - - I mean, we basically contract with companies to deal with disposal of our equipment, which means reselling or essentially remarketing what still has viable life. And with what doesn’t, then that gets recycled basically. So, yes, we do - - some of our equipment at end of life, useful life to us, does get resold.

INT: Good to know. So now we’re going to shift a little and talk more about the role of energy efficiency. You mentioned that’s of key importance to you. Can you give me an example or two of recent major investments that have been made in one of your data centers that improved the facility energy efficiency?

R: Well, so in our leased facilities we have worked with the sort of owners of the co-location facilities to improve the efficiency of the HVAC system to raise the operating temperature to manage air flow in the room to reduce mixing of hot and cold air, and in other ways to reduce the energy consumed on the - - by the cooling plant, which is in most cases one of the biggest contributors in terms of inefficiency.

In our own facilities we’ve designed them from the ground up to be extremely efficient. So we rely on outside air cooling pretty much exclusively. Most of our facilities that we built have no mechanical chiller plant at all. So we use outside air with evaporation to - - when the outside air is too warm. And so the net effect is that we get - - take the cooling overhead down from an overhead of 50-100% of the ITN energy to more like 5%.

INT: So the - - when you started telling me about the recent examples of the upgrades in the co-los, that was an attempt to bring those a little bit more up to speed to your state of the art new data center facility - -

R: Correct.

INT: - - as a way to - - it wasn’t like you were trying some new technology there, you were just trying to improve the older facility’s energy efficiency? Is that - - am I interpreting that correctly or - -

R: Yeah.

INT: And in general when - - it sounds like you - - whenever you build a new one, you try to incorporate the most state of the art strategies or features, technologies, in your new facility, do you usually - - is that always the case, or do you first try something out in one facility to make sure it works before you adopt it in all locations?

R: Well, that’s a good question. We built a series of facilities, basically four sites. Each of the sites has multiple buildings. And that’s happened over the last five to - - started about six years ago. We have improved the technology over time, so we’ve adopted different technology. For example, we used to - - when we started, we were using a particular approach to evaporating water to cool down the incoming air using spray nozzles that over time - - after we got some experience with that and as we looked at other options, we decided we would try out some different options that involved using what’s called [wattage] media.

And so we built - - the next couple of buildings that we built used that, and we’ve concluded that that actually is a better solution and uses less energy and in fact less water, and it’s robust enough in terms of how long it lasts. So we do try new things in new builds, and there’s obviously a trade-off there between what kind of advantage do we think we’re going to get versus what potential risk do we see. And so we go through an evaluation as we’re exploring each new build to figure out what things make sense to actually try.

INT: And so you --

R: Mostly we don’t - - mostly we don’t go back and retrofit the existing facilities because the cost of that would be pretty high, and the savings would not be - - so far we haven’t found situations where we’ve done something different in a new building and felt that the savings were high enough to warrant doing it, going back and retrofitting all of the existing ones.

INT: And do you take the same approach to major investments that improve server utilization? Do you do some testing there, too, or kind of trying it out in - -

R: Yeah.

INT: - - in one area first?

R: Yeah, absolutely. We’ve done a lot around both the server hardware where we’ve got a team that works very closely with our suppliers to make sure our servers are as energy efficient as possible. And they, so for each generation of servers, do a lot of experimentation, if you will, of exploring different approaches, and sometimes will build some prototypes and evaluate them. The nice thing about that is you can build a prototype server for a modest amount of money. It’s hard to build a prototype data center. So it’s a bigger commitment on that side.

And then on the software side, when you think about the server side efficiency, there’s a lot of stuff that we’ve done on the software side to make - - to improve utilization, to reduce energy consumed by servers when they are not heavily utilized, so that during periods of light computational load, we do a bunch of things to basically put idle servers into a lower power state so that we consume less energy.

INT: And I’ve heard - - and I’m not an IT expert at all, but I was told to ask this, too. Do you currently use all the energy efficiency technologies that are built into your servers, or do you sometimes turn those off? I’ve heard that companies sometimes turn these features off?

R: That’s a really good question. And I think there certainly are features built into the CPUs that we probably don’t use, but I think we use - - in terms of the potential impact of those kinds of features, we’re getting pretty much everything that’s feasible.

INT: In general do you think your company thinks about facility efficiency and IT utilization efficiency together or separately, or does one dominate the other in investment decisions, or does it just [happen on 29:03] different cycles?

R: Could you say that again? Do we think about what?

INT: Do you think about facility efficiency and IT utilization efficiency holistically or as two separate factors in your decision-making process?

R: It’s done --

INT: Or is one always going to dominate the other in your investment?

R: No. No. It’s done very holistically.

INT: Are there any examples of energy or utilization efficiency technologies that you can think of that you’ve chosen not to pursue for some reason, or you looked at and you said, oh, that won’t work for us?

R: We have looked at a bunch of things that we haven’t used in some cases because they were too experimental and the risk of using them seemed too high, in some cases because they might give some efficiency advantage but at very high cost. I think a lot of people - - there are a lot of technologies out there that people are trying to sell which are actually, I think, useful if you’re taking a traditional data center and trying to use that as kind of your basis for design and then improve it a bit. We really, in building our own facilities, started with a clean slate and have achieved a pretty extreme level of energy efficiency, but in fact at typically lower cost than you’ll find for a traditional data center.

So a lot of people approach us and say, we’ve got this great technology that will make your facility more efficient. In many cases it actually won’t because we’ve already gotten all the benefits that they said that they could provide. They’re comparing to a traditional data center with a PUE of 1.5 or 2. But often it’s at a much higher capital cost. And we’ve been really focused with our engineering team on develops solutions that are very efficient, but on - - at essentially the same or cheaper capital cost.

INT: So when you said the efficiency improvement comes at too high a cost, you meant you’re focusing there on the capital cost. You said also sometimes the risk is too high or there’s something -- ?

R: We’re focused on total cost. So if there’s some up-front capital cost but it pays back in various ways through energy savings and so on, that’s fine. The problem that we’ve seen with a lot of things that people approach us about is that it pays back if your starting point is a data center with a PUE of 2. We have a PUE under 1.1. So the savings that they would provide us often is tiny, but the capital cost is very high, which means from a total cost point of view it’s still - - it’s not a savings. It’s a big expense.

And so we are looking at total cost, and we’re looking at energy, but we’re not going to spend an enormous amount of money to save a tiny bit of energy. We’re going to focus our money and our people’s time on things that will be - - will save as much energy as possible, so big energy savings, and as cost-effective way as possible.

INT: And are there other factors that come into play that might cause something to be too risky or where there’s a trade-off between the efficiency improvement and, I don’t know, some potential things? Are there reliability issues associated with a new technology that you wouldn’t - - that would cause you to perhaps not adopt something because the risk of that breakdown is too high or other types of performance factors or even, I don’t know, climate location specific factors that come into play?

R: Reliability is a big issue, so - - and that in the end to a large extent that plays out as cost, because if we’ve got to replace or in other ways fix or maintain equipment, then - - on a very frequent basis - - then over a 10- or 20-year life of the data center, I’ll say 20-year life of the data center, the up-front cost might be small, but the total cost might be very high. So we’re going to - - and if you’re talking about replacing equipment very frequently and there’s a lot of it, then there’s the question of what’s the impact in terms of - - for example, resource consumption, there’s all this stuff that you’re constantly replacing and disposing of.

So we do look at reliability. We look at resources in terms of if it’s just stuff that’s kind of disposable that we’re going to go through every three months and have to get new ones, those would definitely - - that would definitely be a downside. We have to weigh it against what the advantages are.

INT: Can you think of an example where there was either a reliability issue or any other factor that ended up tipping the decision one way or the other?

R: We’ve looked at - -

INT: That could be synergies, I assume, between these other factors in the efficiency improvement?

R: Right. We’ve looked at some cooling technologies that looked interesting, but in the end we felt weren’t proven enough to deploy at the scale that we would want to deploy it, that that would be too much risk. So we’ve experimented with some of them in the lab but don’t feel that they’re ready yet.

For example, various liquid cooling approaches, some of them that there’s some technologies people are trying to sell out there that bring liquid into the server, basically running liquid through the heat sync on the CPU, for example. And we’ve have a lot of concerns about the reliability of the various connectors for the tubes and the ability to maintain the servers and what would happen if there were a failure of any of that and you had liquid all over the servers, especially if it’s water.

So, yeah, things like that where we’ve - - the technologies looked interesting in terms of the ability to save energy in various ways but - - and where the cost actually seems reasonable, but there wasn’t enough experience that we felt comfortable deploying at scale.

INT: What about - - a few other things on my list here. Does financing ever factor into your decision related to reducing energy use? Do you face any borrowing constraints, or do utility or state incentives ever play a role or tax rules?

R: Financing not so much for us. Incentives, whether from utility or the state, yeah. And we - - that’s an issue in site selection, and it certainly affects in the end what the total cost would be of building in a given location. And certainly when we evaluate the cost of any particular technology, we look at what incentives might be available, whether it’s utility or state or taxes or whatever.

INT: Are you ever able to use the potential energy savings from your investment to negotiate revised electricity rates for your data center?

R: Not that I know of.

INT: Do you have any company-wide energy efficiency policies or approaches that play a big role - -

R: We’ve got really the compass - -

INT: - - in the company-wide goals?

R: We’ve got a company goal of improving energy efficiency of our data centers that already pretty damn good. But we’ve got internal goals to improve them every year and similarly for our servers. And we’ve got goals for our office facilities, as well.

INT: So thinking about all the factors that you’ve mentioned so far, it sounds like you incorporate them all into your kind of total cost calculation of a new investment. Do you do that quantitatively? Do you make this sort of quantitative ROI or payback calculation that includes all of the future maintenance costs, et cetera, that we mentioned?

R: Yeah. We’ve got a in some ways moderately complicated cost model for facilities as well as servers and so on that factors in up-front cost, cost of energy, cost of sort of operations in terms of people’s time to monitor and maintain the system’s maintenance repair costs, et cetera. So all of that’s factored in.

INT: And do you have a required ROI or required payback for a particular new technology or feature within your company for you to consider it?

R: We’ve got a rough rule of thumb that we’d like to see for a major upgrade a three- to five-year payback. Or say if we’re installing solar which we have done a little bit of our data centers, but mostly not. Mostly we’ve done that at our headquarters and other offices. We’re looking for - - in that case we’re looking for on the order of a five-year payback, for example, if we can get it. We’ll consider longer.

INT: Is this three to five - - are you talking mostly about facility upgrades now, or would that also apply to IT equipment or servers?

R: Facilities. Facilities, yeah. IT is - - I mean, the useful life of IT equipment is - - a five-year payback on something that you’re going to replace in three years would not be - -

INT: Right. Right. But do you see this three- to five-year payback on something that’s more facility investment or system shorter than the life of that system in your data center?

R: Yeah, typically.

INT: And why do you think you need that investment to pay back sooner than the amount of time you’re going to hold on to that equipment?

R: Well, it - - so it honestly depends. When we deploy a new facility, we will - -if there’s something we could do differently that will reduce or at least not increase the total cost, but save a substantial amount of energy, then we’ll do it. And when we’re talking about retrofits, I think we have a slightly higher bar simply because we don’t have the internal band width to do a lot of retrofits.

So we’re trying to filter out the projects that are just going to be less cost effective and save less in terms of total amount of energy saved. So we will consider ones that have a longer payback, especially if it’s - - if it involved very substantial savings, but - - in terms of energy, for example, - - but just a longer payback. But as a rough rule of thumb, there needs to be a really good reason to consider something a retrofit with a really long payback.

INT: I’m looking through the list that we provided you of various technologies and energy saving strategies. And I think you were asked to check off which ones you’ve actually tried or would use again. It sounds like - - looks like you guys have tried everything under the sun. So I’d love to ask you about some example where you’ve tried something and decided not to use it again, but I can’t find an example of that on here. Maybe there’s - - maybe you can think of something, though, that isn’t included in this list. I’d love to hear about your experience on something that didn’t pan out or you would never consider it for a particular reason.

R: Yeah. The truth is we’re - - there certainly are specific technologies from specific vendors that we have evaluated and decided not to use or, as I said, when I think about the evaporative technology we use to make our fresh air cooling approach work, we started with an approach using spray nozzles and have moved to an approach that involves wetted media that’s more like what you would see in a typical cooling tower, though involves much less water.

So we have shifted in the sort of very specific technologies, but in terms of the - - I would describe what you have here as technology approaches. Like isolating hot and cold aisles, we basically have complete containment of our hot aisles. We use blanking panels because otherwise you get air bypassing the servers, and you don’t’ actually - - you’re not putting that cold air to good use. You’re just letting it go through. The exact way we do it has evolved over time as we figured out ways to do it more cheaply or in ways that are easier to maintain. But the overall approach is still the same.

INT: And what about water side economizers? I must admit I don’t even know what that means. But you mentioned that you would consider using that in the future but don’t right now. Can you tell me - - maybe you could tell me more about what that is - -

R: Yeah.

INT: - - or why you wouldn’t consider it yet.

R: Well, so the way our data centers are designed, it’s actually not relevant. So our current facilities all use basically outside air brought directly into the facility to cool the facility. So we take the hot air coming out of the hot side of the servers and essentially blow it out the window onto one side of the building and bring in fresh air on the other side. When that fresh air is too warm, we evaporate water to cool it down. And so water side economization - -

INT: When it needs --

R: When it needs it. So we don’t - - there - - on a 70- or even 80-degree day, we don’t need to evaporate any water. The air’s plenty cool. We can run the cold side as high as 85 degrees Fahrenheit. So if it’s hotter than that outside, then we need to evaporate water. Water side economization is - - the idea there is that typically there’s a closed chilled water loop with a heat exchanger that runs to a chiller plant, and the hot side of the chiller plant where it basically is - -it’s a heat pump essentially where it’s exhausting the heat. Typically, that’s done with a cooling tower. So it evaporates water but all the heat is removed in the end by combination of the chiller plus evaporating water.

And water side economization means bypassing the chiller when you can get all the cooling you need just by evaporating water. And since we don’t use chillers, it’s not relevant to us. We may at some point switch to a design where that would be relevant. And at that point we would absolutely consider and almost certainly use water side economization. But the short story is right now it’s just not relevant to the way we design our systems.

INT: That makes sense. Let me see if there’s anything I missed here in my long list of questions. Is there anything I haven’t asked about that you would even think influences what technologies or other strategies you’d use for your facilities that you would like to share?

R: I don’t think so.

INT: No?

R: Yeah. I don’t think so.

INT: Well, then, I think we can wrap up a little early. And thank you again. This is very helpful to us. And if you’re interested in seeing the report down the road, it will probably be months away because we’re still conducting interviews and hopefully some focus groups. But I’m sure we can get you a copy of it.

R: Sure. That would be great.

INT: Yeah, through Beth or something. Thank you very much again for your time.

R: My pleasure. Take care.

INT: Bye-bye.

R: Bye.

[END OF INTERVIEW]