

INVESTOR DAY 2014: CLIENT TECHNOLOGY SOLUTIONS

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October 28, 2014

Good morning. I'm here for the fun part of this presentation: to talk about the technology. How many of you have seen the Tech Expo? Good number. So you saw part of what we have built and I encourage the rest of you to go visit the Tech Expo after the Q&A.

We are a leading financial technology company. Both Curtis and Brian talked about how all our services are delivered through technology. We have a fairly large number of technology professionals and we do invest a significant amount in technology every year so our clients don't have to.

Let me talk to you about how we have made progress in increasing the return on technology investment in the last two years. We have done that by simplifying our technology as well as by leveraging our Global Delivery Centers and shifting more of our technology dollars from tactical to strategic initiatives. In short, we are doing more for less.

In technology, there are two major components, infrastructure as well as application development.

Let me talk to you about infrastructure. With all the digitization that goes on, the demand for our infrastructure services continue to go up. As you can see, both storage, as well as computing has gone up. Not too long ago the cost of storage used to be very high, so the result was we didn't capture all the business events and the details that are necessary. We only captured what was necessary from a regulatory perspective. But in the days of Big Data, you can see that we need to capture a lot more data around all the business events and the client interactions so we can deliver actionable insights to our clients as well as to our businesses.

And same thing is true for computing; the more data that we have, the more computing power that we need because things like machine learning and predictive analytics are going to play a major role in technology, and that's what our clients have come to expect.

In spite of these increases in demand for the various infrastructure services, our infrastructure cost has actually come down, and it is down by 6% in the last two years. We have done that by making sure we continue to reduce the unit cost and we provide lots of choices to our application developers. For example, in storage, we have many storage peers at various price



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points. People can use appropriate ones for their different needs and we've also done the same thing with computing.

We now have a cloud offering that makes it possible to use the capacity when they need it and release them when they no longer need them. In addition, we've also improved the service level. If you look at the number of customer-impacting incidents in the last year, it has dramatically come down. So we offer a better service level.

We have invested in a new initiative called Digital Workplace to improve the productivity of our employees.

We are also continuing to modernize the infrastructure.

And we continue to invest in information security to mitigate all the technology risk.

So in summary, we are doing more for less from an infrastructure perspective.

Now let me talk to you about the other component, application development. To create great software you need great technology talent. And to be an effective technology professional, you not only need to understand the technology that you work with, you need to understand the business, you need to understand the clients you serve and their needs, as well as you need to understand the architecture that's unique to us as well as the process by which we create software. To do all that, it takes effort and it takes time.

Not too long ago, many of our businesses had close to 30% of their technology staff as consultants and we would get them at the beginning of the project and at the end of the project we would release them. And in the middle, we actually spent time training them; not a highly productive thing to do.

What we have done is we have in-sourced all those consultants. We are not completely done yet, but what it allows us to do is to create pools of talent in various competencies that we need so we can deploy them according to business priority on the various projects. That makes a huge difference.

In the process of insourcing, we have actually created 8% more capacity in application development. Now, having highly productive technology talent in this day is an asset and that's exactly what we are trying to build here.

In the process of creating the 8% extra capacity and a highly productive technology talent, we've been able to keep our costs low. Our unit cost has come down by 6% in the last two years and our total application cost has come down by 1%. In addition, we are also enhancing the talent pipeline by recruiting from leading campuses, and we've taken a fairly large number of interns and fresh graduates in the last two years, put them through a training program so they could be effective when they start working on our projects.

As Curtis mentioned, we've also created an innovation center in Silicon Valley. I think it's critical to our success because the way the Internet companies build technology and the way the financial institutions have historically built them are very different. And for us to be successful, we need to figure out how to connect to the ecosystem of unique talent that's only available there where you get to listen to what other companies are doing and, in many cases, they actually share their technology through open source and we're able to leverage them. We are also creating innovation centers globally – in Chennai, in Pune, as well as in Jersey City – to make our existing employees highly productive and collaborative so they can get up to speed on the new architecture as well as the ability to reuse common services.

I would say we have delivered more for less. And not only have we delivered more for less, we're also very careful about how we deploy these technology dollars. In the last two years, we have shifted close to 20% of our technology investment from tactical to strategic initiatives.

Let me talk to you about three of them today.

The first one is how do we simplify our technology? We do that through our architecture. This architecture has three major components. Let me start with the bottom one.

It is what we call a data center versus service. This is where you have the data centers and the infrastructure, the hardware operating system and such, and there is a tremendous change that is taking place. And this has a very short life, and companies like Google and then Twitter employ a phenomenal amount of computing power to do what they need to do.

At one point in time, we looked at outsourcing this particular layer, but we thought outsourcing may actually constrain us from taking out infrastructure to the new world. So we chose to keep them in-house. And as I mentioned, we actually got the benefit financially already and we will continue to get that.

The next layer is the application layer. Now this is unique to BNY Mellon. This is what is the comparative advantage to us and this has a very long life. Applications that we build tend to be around for 25, 30 years. What's critical is to make sure we build them in such a way that they are not too tied to the underlying infrastructure. And that's one of the objectives of our architecture.

And the last layer is what we call the layer of innovation. This is where our clients interface with BNY Mellon either through a portal or through some kind of an API. And this is a very short life and clients expect us to provide the kinds of services that they expect at home and this is where we use things like iPhone and iPad and hopefully soon Apple Watch. That's the kind of innovation people expect us to provide in this layer.

All these three layers are what we call BXP. It's BNY Mellon Extreme Platform. For those of you technically inclined, it's a platform-as-a-service. The benefit for a developer is they don't have to worry about all the complexities of this ever-changing infrastructure at the bottom and there is a framework for you to build applications and it makes it easier for use to use common

business services. The end benefit is, you make the developer highly productive, you make things faster; the faster time to market is important.

Where do we see the benefits already? One of them is the time it takes to provision infrastructure clearly has dramatically come down. For example, it used to take three to six months from the time someone wants a particular server, we place the order, it gets delivered, it gets cabled. That's no longer the case. Any developer can provision the infrastructure in under 40 minutes. And that makes it possible for them to use them when they need to and then release them. And as you can see, the cost of ownership has come down as well. Overall, from a time-to-market perspective, it's making our developers productive, so it's making it easy for us to build solutions for our clients.

The next benefit is the client experience. This is the top layer, I was talking about. We use a methodology by Forrester to measure the client experience and now we have done that twice in a year. We are able to see the progress that we're making in terms of user satisfaction, client experience as well as the Net Promoter Score. And this is something that allows us to objectively measure the client experience as perceived by them and continue to improve this.

Now let me talk to you about the second initiative, is what we call Digital Pulse. Now, why do we need Digital Pulse? Before I get to that, let me give you a bit of research from MIT.

MIT has looked into lots of financial institutions and other institutions, and they have kind of come up with dominating cultures in various institutions. So let me start with a culture of heroics. This is where you have critical people part of delivering service and when they're not around, their service suffers. It's not very scalable; it's obviously not preferred. A lot of people are moving towards the culture of disciplined process. This is where you have common processes and common components, a single interface to the clients. It's better but it's not necessarily engaging all the employees. It's kind of a top-down approach.

The culture that they prefer is what they call an evidence-based management culture. This calls for, if you were to have a single source of truth, a common definition of success, a scorecard to set goals, to measure progress and to hold people accountable, to hold every employee accountable, then they have found the companies do extraordinarily well. This is what we are trying to you implement in BNY Mellon, and Digital Pulse is what makes that happen.

This is as simple as 'what gets measured gets managed.' How do we do it? We have four components. Let me walk through it.

The first one is what we call capture. So this is where we need to capture every business event and the details surrounding it and all the client interactions that go with them. It's easier said than done. We have taken an innovative approach to building that. We are using the concepts of Internet of Things to really get all these business events, so we don't have to open up all the applications.

The next component is store. How do we store all these events in a single repository? And that's critical as well, because when you store them in a single repository, it makes it easier for us to do the analysis. Now, historically people have always measured things and they would do them through spreadsheets and such and the end result was most people spend time collecting the measurements, not necessarily acting on them. And the benefit here is our employees can go to using the data instead of collecting the data and that's the last part. How do we make it possible for our employees to act on it. And as this gets ready for prime time, we would share the same infrastructure, same platform that's built on Big Data, cloud computing and Internet of Things to our clients.

Let me give you an example. We just instrumented one of our businesses, fund accounting. The end result is, they are able to see the service levels and the straight-through processing by fund, by process, by location. They're able to see the relative performance of all location. That's the kind of insight that will allow us to identify the ways to improve service levels, lower cost structurally as well as manage the risk.

This is a major initiative for us and this is something we are deploying across the whole enterprise. In addition to fund accounting, we've also implemented in US Transfer Agency, Corporate Trust and Treasury and broker-dealer services and hopefully we'll begin to see the results of this pretty innovative solution here.

And the third initiative is the technology drives our business. Now, when people talk to me about BNY Mellon technology, they only talk about the custody platforms. Yes, it is true, we have three of them and we are on our way to one, but it really accounts for less than 5% of our technology budget.

We offer a lot more technology literally across the whole investment lifecycle and I encourage all of you to visit the Tech Expo to get a feel for all the kinds of technology we have.

We have great technology on the wealth management space. About 1,600 financial institutions use our wealth management technology platform. We have built and host 600 retail brokerage websites. We actually have built technology for the government to modernize their business and we have an Eagle platform where we service close to \$21 trillion. So we have the depth and breadth of the technology you need to service the investment business.

We are also invested in integrating with lots of third parties. We have close to 250 third-party integrations, so our clients don't have to.

And the last point is our clients leverage our scale to make sure they variablize and lower the costs.

In all, technology is a critical component to what we do and it's not just a matter of costs; we do get a good amount of revenue from the technology.

To sum it up, in the last two years, we are delivering more for less. We are investing in a lot more strategic initiatives and I would encourage all of you to visit the Technology Expo.

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