

Episode 34: Treasury Technology Outlook

ION Treasury

Craig Jeffery: Welcome to The Treasury Update Podcast. This is Craig Jeffery. And we are in the middle of the 2019 Outlook Series. I'm here with ION Treasury. ION is one of the largest treasury management systems technology providers. They have seven core products, which you may be familiar with. This includes Treasura, ITS, IT2, City Financials, Reval, Wallstreet Suite, and Openlink. I'm talking with Michael Kolman, who's the Chief Strategy Officer. He's based in New York. He's been on the FinTech HotSeat at the AFP with us. And also, Paul Higdon, he's the Chief Product Officer. He's based out of London. But he's sitting with Michael in New York today. Welcome to the podcast, gentlemen.

Mike Kolman: Thanks for having us, Craig.

Paul Higdon: Good morning.

Craig Jeffery: This series, we're covering a number of items, and I'll just give the listeners a quick overview. We're going to talk about Libor as a replacement, what's replacing Libor, an aspect of the money market fund changes. We're going to look at APIs. And then we're going to focus on predictive technology, and some of its applications. And then we'll circle back and end with what organizations are doing with communities. So, first, I want to cover technology and treasury process implications in the context of a number of changes that are taking place during this next year. And as we start with the benchmark rate of Libor, which is used in so many contracts. Libor is going away. There's the end date of 2021 looming. Over 350 trillion dollars worth of derivatives, bonds, and loans are benchmarked off of this rate. So, Mike, I'd like you to just give us your take on what's going on with the Libor replacement, and what do we need to think about from a treasury technology perspective.

Mike Kolman: Well, I think the 350 trillion dollar number is certainly a gigantic number. But what's actually, I think, even scarier is that it likely understates the value of the outstanding contracts, where IBOR's embedded. So corporations have revenue, supplier contracts, lease contracts, pension policies, insurance policies, all with Libor IBOR referenced mechanisms embedded in them. It's also important that we don't ignore the IBOR based intercompany loan portfolio, or in-house deposit and loan agreements that also reference IBOR to facilitate their in-house banking activities. And in addition, for items placed on the balance sheet that are on the balance sheet at their fair value, the valuation, the cash flows that impact that fair value are likely also discounted off of IBOR, adding, really, another element to the entire Libor exposure picture.

Craig Jeffery: The impact, the number of assets and activity that's related to Libor and some of the IBOR ratings is enormous. It's very significant. But what should companies do? Or what should they be getting started on to deal with this change, whether it's for intercompany or external contracts?

Mike Kolman: Yeah, it's almost like that understanding where your exposures are, you really need to go out and turn over every single stone, and really look to understand

where Libor exposure could be present. And so, I think with the end date of 2021 looming, as you said, it's really important to start now. And so we'd recommend really focusing this calendar year on understanding where your exposure is, and beginning to develop a strategy on how to address each of the items. So there's still some unanswered questions with regard to the whole IBOR replacement. We would recommend that you speak to your advisors. Big Four briefings, ISDA evolutions, reading blogs, whitepapers, and really just begin, if you haven't already done so, to educate yourself, because the impact will be quite significant.

Craig Jeffery: So if 2019 is a time of exploring and gaining information, how do you turn the page and look at strategies? So what guidance would you give on laying out that strategy to move towards a replacement once you've gained insight into what's one of the best minds with thinking with regard to this change?

Mike Kolman: Well, since the exposure, internally, in the organization, is so far reaching, it's important to really get the key stakeholders involved. Really raising this to the C-suite level, to raise awareness internally, is really quite critical. So the key stakeholder groups that are likely to be involved would include the general ones that you'd expect, treasury group, accounting, procurement, legal, tax, IT. And as I mentioned, speaking to auditors, advisors, and really making sure that the business units themselves are also aware that this is going on, and raise anything to that group that is really leading the charge, that stakeholder group. If you're successful in doing this, you should really be able to understand what that exposure is, and then begin to break it down, and create strategies to manage the implications of each of the items.

Mike Kolman: In terms of strategies, I think one clear one is understanding what exposures will live beyond that 2021 date. So for any contracts that do live beyond the 2021 date, there should be planning and anticipation that they're likely going to require and then mince. And some re-papering work should be planned. This could be time-consuming. It could be costly. And, it might result in certain decisions to refinance. I think that there're, in a number of contracts, fallback provisions in the events Libor, as the reference rate, may not become available. This is most likely, I think, what all the experts are saying, is likely insufficient. It's unsustainable in the current agreements. And so this is certainly a key area. In ISDA agreements, ISDA is meeting to define really how definitions will change. So it will be important to follow along.

Mike Kolman: All of that is external, and your ability to control that is somewhat limited. Your ability to control, actually, for your inner company loan portfolio is much more within your control. And so for this, a general approach could be that you amend loan agreements with the replacement rate, and agree on a somewhat of a transition dates. So, any interest periods that would start, let's say, after a transition date, would use the replacement rate. And this way, you're sure to be able to have a rate available. And also, you'll be also be able to maintain that arm's length lending standard. Also, when it comes to valuation of derivative

agreements, specifically on swaps, this can also get a little tricky. And, so it's important to understand and ask yourselves, within the organization, some certain questions to define what you really need to consider.

Mike Kolman: So for example, will you need to maintain historical valuations of these securities. This can get a little tricky as you get to that period of transition where part of an agreement might actually be referencing a Libor rate, and another part of the agreement might actually be referencing the replacement rate. And, you need to plan that transition appropriately, so that you actually maintain the accurate historical valuations.

Mike Kolman: Another consideration is how can you adjust the spreads for the changing benchmarks so that your fixings are accurate. This might involve updates to the systems where you manage certain agreements. Is there a central source that provides rates for your organization? So, for example, does treasury provide IBOR rates throughout the organization as the central source and provider? So, you need to update and maintain the processes for those as you distribute new rates. And, reaching out to your technology partners, internally, externally, speaking to your peers is also going to be another important aspect of this whole transition.

Mike Kolman: And then finally, the other consideration is on future funding strategies in the next three years as we're approaching 2021, and whether or not, as you put new agreements in place, you want to continue to reference IBOR. Or, if you will begin to adopt the new, risk-free rates, which would be the replacement rates, as it pertains to risk management activities, technology capabilities, and hedging decisions. So, with that, there's a lot to consider, which is why, in 2019, you should really take advantage of the time to understand, wrap your arms around really what your exposure is, because that's the starting point for all of this.

Craig Jeffery: Yeah. There's certainly a lot of complexity there with those changes, especially for longer term instruments that roll over the sunset of Libor. Let's shift to money market funds, now, as we're talking about interest rates, short term rates. Money market funds, institutional money market funds, really began reemerging in a significant way during 2018. Rates have risen, pulled a lot more companies back into this asset class, a lot more assets flowed back into there. Maybe you could talk about some of the changes in the institutional money market fund space that are making it more attractive, and more complex, following the financial crisis of years past, and some of the regulations that came forward.

Mike Kolman: Yeah, I think it's a great point. Certainly, the financial crises had changed a lot in the worlds of corporate treasury, in terms of keeping more cash on hand, liquid, in short term investments. Obviously, at the same time, we also saw interest rates go to zero, or sometimes negative. And now we're getting to a period of time when we're seeing interest rates come back. And, in the movement of funds into money market funds, is actually been quite interesting.

And so I was just looking at some data before this podcast. And, there are three trillion dollars invested in money market funds. 190 billion dollars of new funds flowed into money market funds during the fourth quarter of last year, of 2018. And this has really been the highest inflow of funds since the fourth quarter of 2009. So it is quite interesting to see this, and it's not surprising the flow of funds is coming now, because rates on the money market funds are somewhere around 2.5%. Following a period of time when rates were at half a percent until early 2016, and now, breaking the 2% mark in mid-2018.

Mike Kolman: The other implication that we also saw was with money market fund reform. And so, when we look at the impact that that had, the investment in money market funds really took a dramatic shift from large institutional funds, and into government treasury retail funds, following this reform. And the reform introduced the concept of floating net asset values, or variable net asset values, or NAV, for the large institutional funds. Which is different from the government treasury retail funds that are still have a stable net asset value.

Craig Jeffery: Yeah, let me ask you a question on that, Mike. With that change to floating NAV, as assistant provider, you had to make some changes for that. What did you have to do? Just give us a glimpse into what you've had to do to adapt to this change in operating models for these funds.

Mike Kolman: What change really is, the price of the fund was marked at a dollar, for stable net asset value funds. So the switch to floating NAV, that one dollar share price changes. It floats, just like the name implies. And so, in order to accommodate for the changing valuation, bringing in certain money market fund factors, updating the price, and all the downstream implications, in terms of valuing the underlying investment, your overall investment in money market funds, accounting for valuation changes, all had to be updated. So, while we made the technology updates required to manage the floating net asset value funds, what we saw was not a very large uptake in that functionality, because while the functionality provides the support to manage it, at rates that were half a percent or even lower, a lot of companies, like we saw, where the flow of funds went, was really more towards those stable net asset value funds. And so we didn't see the uptake of the floating net asset values, even though we provided management for that in our technology solutions.

Mike Kolman: Now, as we fast forward to today, where rates are at 2.5%, they are attractive, perhaps the large institutional funds are becoming more interesting to corporations who may be willing to adopt. So, I would urge others to contact their technology partners, and review what capabilities they have in order to manage those floating net asset value funds. And that could help reduce some of the ... and manage some of the complexity that comes along with it.

Craig Jeffery: So, another area of change, money market funds and the technology required to support those, and as we shift to the third topic, APIs, connecting via open API, we get to bring Paul into the conversation. And, a key part of that element

is, Paul, you and I have talked about 2019, as you've talked about APIs and open APIs, you defined 2019, or described it as the rise of open banking.

Paul Higdon: Yeah, our view is that APIs are becoming more prominent, and we think 2019 could be the year where we start to see more adoption by the corporate treasury community. But it's worth taking a step back, because APIs are really just one piece of a bigger technology puzzle. And it's probably worth reflecting on the fact that we're pretty much in the middle of what we might call a digital revolution right now. And very interesting to see that technology's transforming both our personal lives, and our work lives. The APIs are going to play a key part in that. But just one part. So it's interesting to kind of reflect back how we've got to where we are, and if we look back over the past 30 years, I think there are three key events that have happened that mean that we need these APIs.

Paul Higdon: The first one is the increase in computing power. And this has been astounding. If you think back to the 1980s, which was just 30 years ago, the most powerful computer in the world was something called the Cray-2 supercomputer. That cost 34 million dollars. And if we look at the processing power that we all have today, a simple cellphone, like the Apple iPhone X, has got 10 times the processing power of one of those supercomputers, it costs around a thousand dollars, and we get to carry it around in our pockets. So, this really has the ability to transform the way we process information.

Paul Higdon: The second big thing is the rise of the internet. Looking back only 20 years, the internet was really in its infancy. And there were only about 16 million users, worldwide, and that's less than half a percent of the global population. Fast forward 20 years, by 2017, 4.2 billion of us have ready access to the internet. That's about 55% of the world's population. And this is not stopping. This is increasing. We're all becoming connected, we've all got these super fast computers accessible to us.

Paul Higdon: And then the last point, there's been a real desire to go mobile. Even going back 10 years, the first iPad hadn't even been launched. Within three years of its launch, it had already superseded sales of desktop computers. So this is a real indicator that we, as a population, we're demanding immediate access to information, and then gradually, we're expecting to be able to transact and act upon that information, at any time, from anywhere, on any device. And it's the APIs that are actually going to facilitate this. Basically, act as the glue to bring these different concepts together, and start delivering value to treasury.

Paul Higdon: I mean, the term open banking is a hot topic. And really, this is an initiative that's been placed upon the banks to create increased transparency to their customers, potentially allowing increased mobility, so customers can move between banks more effectively. They're facilitating that through APIs, and that's where we come to this term, open APIs. And one concrete example that we've been working on is the collection of bank balance. So, a number of the banks have produced an API that you can call, that will deliver real time

transparency into exactly how much cash you have in one or all of your bank accounts, from a single API call. Gone are the days of relying on prior day files and intraday transactions to know how much cash you've got. In this brave new world of APIs, imagine the not too distant future when all of the banks have delivered this capability, then you'll be able to get real time transparency into exactly how much cash you've got, on a global basis.

Craig Jeffery: So the impact is, for treasury, this one example is, real time as opposed to just prior day, just faster ... is it an easier to make those connections. What else can be done to leverage this type of technology in treasury, the use of open APIs?

Paul Higdon: Yeah, so it's a great question, and it's a hard one to answer because we're really early days in the adoption of these APIs. The balance example is something that I think is going to impact all treasuries. Another example is, as well as balances, these banks are delivering the ability to see your transactions that are going across your bank accounts in real time, as well. Imagine what impact that could have on treasury. It really has the ability to transform, or revolutionize, many cash management operations. Imagine your treasury management system being completely synchronized, not only with one bank, but with all of your banks, giving you real time balances and a real time view into all of the transactions, being able to reconcile those transactions the moment they come into the system, alert you as a user if there's an unexpected item so that it can be processed in real time. It completely eliminates the need for end-of-day or start-of-day batch processing that most of the cash management's departments around the world are performing today.

Craig Jeffery: Okay, that's excellent. So it's not just information, it's alerts, it's more real time data. So as you think about treasury has long been thirsty for information and it's been coming in drip formats, it's been difficult to get, and as we've expanded the ability to get that information, it sounds like treasury is going to be getting far more information, now it's trying to drink from a fire hose, and it can perhaps overwhelm the team that's getting all of this real time data. So how ... Maybe we can segue to the next thing about predictive technology and the application machine learning. How can we handle this deluge of new data and take advantage of it? We can't do it in the traditional ways, because we're getting so much more. How can we leverage machine learning to take advantage of this?

Paul Higdon: Yeah, you're absolutely right. So we've solved one problem, and we've created another one. We've now got all of this real time data, so we need to create systems that are going to help digest and make sense of that data, and turn it into something useful that the treasury team can act upon.

Paul Higdon: And you mentioned machine learning. Artificial intelligence, in general, is something that, again, we're going to see a bigger uptake, or adoption, in treasury of some of the artificial intelligence techniques. And some of the newer techniques as well, I think. And it's probably worth clarifying what we mean by

artificial intelligence. Classical artificial intelligence has been around for a long time, and by artificial intelligence, all we're talking about, really, is an artificial system that can perform some complex tasks. So you imagine the kind of logic based systems that have been around since the 1950s, ever since the advent of computing. We've been finding applications for that classical artificial intelligence in treasury for many years. Things like automating the creation of cashflow schedules based on financial contract terms. Things like generating the accounting related to all of your financial activity. So your entire portfolio, your treasury system will calculate all of the required journals, including some quite complex business calculations. All of that's already outsourced to these intelligent systems.

Paul Higdon: So, there are a couple of new advents in this area of artificial intelligence. One is robotic process automation. We've heard a lot about that in conferences over the last couple of years. And here we're talking about new systems that, in fact, try to mimic what humans do. They watch what a human does in terms of its interaction with the various systems that the human used to perform its job, and then they mimic. They play back. They do the same thing. And they allow you to automate processes that require involvement with many different systems.

Paul Higdon: Now, I don't think, generally, those RPA solutions are mimicking the thought process of a human. Or trying to enhance decision making. They can be integrated into RPA processes, but it's not really the core of what RPA is about. However, there are other new developments in artificial intelligence, such as machine learning, which do bring something completely new to the table. So, machine learning is a new kind of artificial intelligence that is able to make use of large data sets, and the increased processing power that we talked about with computers. And it involves self-optimizing algorithms that actually are able to identify patterns, and trends, and strategies that maybe the human isn't able to identify themselves. It's a new kind of facility that the human treasurer can work hand in hand with to outperform a human on their own.

Craig Jeffery: Maybe you could jump into what makes machine learning so different from the classical AI, as you described it.

Paul Higdon: It ... And I think this is why it's a really hot topic at the moment. There have been some significant breakthroughs in machine learning. And in particular, there's a technique. This is going to sound a little bit technical, but it's called deep reinforcement learning. And it's a progression or a development within machine learning that tries to mimic the way the human brain works in terms of its learning and decision making. And there's been quite a bit in the news about this recently, and there's a story that illustrates this very well, related to computers playing chess, and in particular, computers playing chess against each other.

Paul Higdon: Craig, I'm sure you remember back in the nineties when Deep Blue, from IBM, first beat Garry Kasparov, who was the reigning grand chess master at the time. There was a big uproar about computers finally being better at something so complicated as chess than humans. And it was a big achievement. Well, 20 years on, I'd say the great grandchild of the Deep Blue program was something called Stockfish. The program had developed to a stage where the chess community felt that this application could never be beaten by a human being. It was so good at chess, it had access to over 2000 years of human strategy, it's got to access to a huge number of games that it can search almost instantaneously. So it's got an unfair advantage against any human. That could've been the end of the story, but then we've seen this rise of deep reinforcement learning, bringing a new breed of artificial intelligence.

Paul Higdon: And in fact, a new program called AlphaZero was released that was a generalized algorithm that could learn to play any game, not only chess. And it was decided to pit this program against Stockfish. AlphaZero was only given four hours to learn how to play chess, after it had been given the rules. So it played itself about nine million times, and figured out its own strategies without any input from the human strategies. So the two computers were set to battle each other. They played 100 games. 72 of those games were a draw. And then, here, you can guess who won the last 28 games. Sure enough, it was AlphaZero. This program, this algorithm had gone from zero knowledge of chess, to beating the culminative knowledge of everything that we've built into programs in the past, by teaching itself.

Paul Higdon: So it's a very exciting time, as a technology vendor, to now start exploring how we can start taking advantage of similar kinds of algorithms.

Craig Jeffery: Yeah, that's excellent. That seems like quite a powerful tool. I like the four hours and played itself nine million games of chess. That's amazing. But obviously, treasury has optimization things in similar regards to game theory, and in ways that have to be optimized, but it's not a game, treasury, of course. There are, obviously, some algorithms that treasury could use. How can this technology be applied directly into the treasury space that's being done currently, or you expect to see happen shortly?

Paul Higdon: Treasury is a completely different ballgame to chess. It's got all sorts of complexities related to uncertainty and complexity in the market, that we definitely don't have solution yet, that allows such an algorithm to run treasury for you. But what we are doing is exploring various applications of the underlying technology. So for example, we're already using this deep reinforcement learning in a number of ways, for things like intrusion detection. Our job is to keep your data safe when you use our treasury systems, so we use this technology to monitor access patterns, and make sure that we detect anything unusual, so that we can shut down access if we need to. We use it for things like biometrical authentication. As a user, if you're logging into your treasury system and you want to approve a high value payment, we need to be

certain who you are. So, we can use deep reinforcement learning for things like voice recognition, face recognition, and even behavioral pattern recognition. So how you interact with your cellphone. How you type. Which angle do you use it ... you hold it at. To make sure you are who you say you are.

Paul Higdon: And then also things like natural language processing, to make the use of our applications easier. You can type natural language rather than key search terms in order to search through transactions, through menus, through help systems. So all of these are essentially invisible applications of deep learning, but you already start to get the benefit of within our applications.

Craig Jeffery: Paul, I like that. The first two, where you talked about intrusion detection, and bio-metric authentication is really around security. I think that's interesting because so much of the fraud that criminals are organized, they're using technology to penetrate systems, to find weaknesses, and to explore, and so they're making massive use of technology. Now it's also a technology battle to prevent that, to see what's anomalous, to see what's different, to make sure people are who they say they are, and not just a machine that has stolen credentials and is now exploring and finding out what's going on. You have described and talked about some of your partnership on looking into other ways to use and leverage AI and machine learning. Maybe you can just talk about that.

Paul Higdon: Sure. I can't share too much of the detail here, but we're now moving into what I'd say is our second phase of trying to find applications that are much more visible to the treasury team. And to do this, we've actually entered into a partnership with one of the leading technical universities in Europe, who have specialisms in artificial intelligence. And we're sponsoring a research program there, where we've worked with the teams to identify some candidates for what we think could potentially be high impact areas of treasury management that are good candidates for applying machine learning to.

Paul Higdon: For example, actually, I can tell you that the one that came out top of the list is cash forecasting. This is something that has proved difficult for treasuries around the world to do accurately. We're currently exploring with the university there, which are the most appropriate algorithms for us to employ to look at historical cash management information, and use that, along with forecasts from internal entities within the business, to provide more accurate forecasting capabilities going forward. And there are a few other applications that we're exploring, and we anticipate rolling these into a number of our applications throughout 2019 and onwards.

Paul Higdon: So, yeah, we expect ... We're obviously investing here, so we expect machine learning to play a significant role in the future of treasury managements. And we're investing now, not only in the technology to build the algorithms, but also starting to think about how we would build the learning data sets that the

algorithms need to become really effective across the community of all of our corporate customers.

Craig Jeffery: And just like the chess example of playing nine million games, there's a lot of data needed for that learning environment. And maybe we can just shift to the last area and bring Mike back in on treasury communities. ION has been talking about communities and what that means for treasury, both in terms of sharing best practices, leading practices, and data, that can provide insights. I want to just hear some of your thinking on this from a technology and/or data perspective, Mike.

Mike Kolman: I think almost all of the topics, if not all of the topics we covered today, likely that will be covered on this podcast series, really have an element of community. It's not just about our organizations. It's really about our industries, our practices. And I think we start to see that more and more, and becoming more and more of an integral part of really what we do.

Mike Kolman: And so, as Paul mentioned, with machine learning, for example, our greatest opportunity for new insights requires the ability to learn and build off of large data sets. And then share those insights, and share that learning to inform the community as a whole. There is an element of sharing that exists today, and when we think about community for short, and I think our natural inclination draws us to our peers. I might be drawn to other people in treasury who have a similar role as the one that I have. Or, I might be drawn to others who use a similar technology that I use. And I think this is really community in the traditional sense. These communities, in this sense, play an important role. And they will continue to play an important role in advisement, in validation, in promoting shared interests. Is there a better way to do what I'm doing? How will I ever get my arms around understanding this enormous exposure to Libor? These communities, in the traditional sense, can certainly be therapeutic, and anxiety reducing, for sure.

Mike Kolman: However, when we start to think about the opportunities that new technology brings to us, and we think about communities really more as a source of innovation, in some ways, we can actually find inspiration from non-peers, and understanding their experiences. And so, for example, when I go ... when any of us go do shopping on Amazon, Amazon knows what I want to buy before I even know I want to buy it. And so, another example that I recently had at the beginning of this football season, when I did my fantasy draft, it was the first I ever did a fantasy game, but I didn't really ... I realized, I didn't have to do anything, because I see the best players that are available to me. I didn't have to know anything about the players. All of the metrics are all being run in the background. And it's providing advice to me on what I should do.

Mike Kolman: When we think about treasury, I don't think there's a single company that can get to that level of insight that's being provided in the fantasy example, or by Amazon, for example. No one company can get to that insight alone. And so it

really does require larger amounts of users' volume history to learn, and experience, and be able to identify some really interesting insights that will really transform the way that we work today. And it really isn't that farfetched to expect that in treasury, the decisions that are being made are fed to us as recommendations from our technology. And it informs the activity really across the entire community. And so as we look into 2019 and beyond, we expect more and more that community will become a greater asset to the whole corporate treasury landscape.

Craig Jeffery: This is fascinating. Thank you for that discussion on treasury communities and data, and wrapping that up. And this concludes this episode of the 2019 Outlook, 2019 Treasury Technology Outlook. Mike and Paul, thank you for talking through these ideas on The Treasury Update Podcast.

Mike Kolman: Thanks for having us.