**Eddie 2**

1. We will only look at this project from the beginning of Y2021.
2. Amy has provided a FVA curve, but we will re-visit if your business case is still valid in Y2021 or do you want to something else.
3. Ben Davis seems to want to include a trading tool, such that, when a customer sends in a RFQ, the following information will be displayed:
   1. All static data about the bond, e.g. issuer, coupon
   2. Everything about the customer, e.g. the last time the customer was looking at, call report (need to check with compliance on this)
   3. Bloomberg, all the BVAL, all the ALLQ (04:15) prices, and link to that particular ISIN.

He needs these information, almost real time, from data sources like Murex, Bloomberg, AXETrading, etc.

1. We are unsure which dashboard tool to use (Tableau might be too slow). This is something that we want to explore with the wider group.
2. Jacky wants to know is there is any other desks that require (near) real time data, which can be things like:
   1. PnL, which can be a little difficult for more structured products.
   2. Market rate / implied rates, which need to be taken and calculated from real time Bloomberg feeds.

Eddie is going to reach out to different desks to see if they have such needs in the next 1-3 years.

1. For PnL, the desk can estimate from Murex, but they don’t run often because it takes time.

For market data, rates are not as simple and fast as equities and futures. Even for IRS, they need to do an IRS on Bloomberg, i.e. do a certain trade and wait for banks to come back, so it is slower. Right now, they pull out things from various sources like Bloomberg, Reuters, and then do their own interpolation.

1. For dashboards, the desk needs more Sales side. In terms of data, it is not as easily available, because some things are not booked inside Murex. Tallying it would be slower.

Legal has this project with T&M trying to put in legal docs, but right now, when the desk asks which swaps are on Master Agreement, it is not easily available.

1. For purged Murex data, if the desk wants to restore the data, they need to ask Ops.

Eddie will check with Andrew Tan on the TDAP data, on whether they are able to view historical transaction.

1. Other than interest rate swaps which the desk intends to put in through the digital channels, there is no intention to move to a platform that enables quant trading in the next 3 years.

The desk only put it in a project to do things like IRS, aggregation / hedging, but it is nowhere near actual Algo / quant trading.

1. For other desks, we will run a POC using their individual business case, and then see the speed test and latency.

If the desk has any needs for near real-time, they can reach out to Eddie.

**Eddie 3**

Background:

1. Apart from bond information, customer information, and market rate information, Ben Davis also requires up-to-date inventory information. He needs all this information to have a latency less than 3 – 5 seconds, as he has at most 30 seconds to respond to the RFQ.
2. Jacky wants to know if there are similar real-time data requirements from other desks.
3. Biggest user of real-time data are the eFX guys. They are doing algo trading, so they have KDB that allows microsecond feed. Other desks may not require this speed, but it would be good to find out if they want to do quant trading in the near future.

Actual meeting:

1. Structured credit has no need for real-time data, as it is a low volume, high margin structured business.
2. For the quant team, they have already built a realtime prototype for handling real time data, e.g. visualize realtime data, reflect realtime PnL.
3. From Jeremy Green, it is not so simple as piping the data / building the system, there are:
   1. Legal liabilities if you cannot justify / audit the data usage. ITT side is building DACS, which will leave an audit trail for usage of high frequency data.
   2. There are design considerations around. There is no one-size-fit-all approach. While we need to think about how to pipe live data into Front Arena, ITT and Jeremy Green are also looking at how to pipe it into Murex.
4. Since quant team already has a realtime prototype, may be there is no need to reinvent the wheel, so ITT can work with the quant team to build up the system.
5. Rather than having rate traders having a little variation of what is effectively the same thing, we can just build one system and put everything inside. Then it is a separate case, because we continue to use Front Arena.
6. We need to circle back to Jeremy Green about usage of realtime data.
7. Other than what Jeremy’s team has built currently, there is no extension to consider the use of realtime for other purpose at the moment. Jeremy is uncertain if this will continue to be the case over the next 3 years.
8. What Jeremy’s team has built is a working prototype, which can be adapted to Ben Davis’ use case, but he may not like using 2 systems. But they have no plan to productionise it, because it has all these data issues.
9. Eddie can inform all relevant parties of this prototype and get a sense of what they want, then Jeremy can arrange a quick demonstration on what has been built and their plans.

**Eddie 1**

1. Money Market is a very different market, there is not really e-trading going on, there is time to quote and get back to the customer.
2. Money Market does not have an immediate need, but is open to exploring a POC on near real time. Eddie will work with Bill to come up with a short business case to try, and see if it fit into the infrastructure, and use that as a TOC to see which solution works best.
3. The infrastructure cost is shared across the entire T&M floor, not borne by any one desk. Credit Trading team is already going to near real time, so that’s a base case to build real time capability, then it would just be extending this capability to the rest of the trading floor. Hence, the one-time cost to get real time will be quite expensive, but it will be shared by various desks that need this capability, and over time, these desks can move to algo and other types of trading that require high speed data.
4. We are not talking about a complete infrastructure overhaul., as we already have infrastructure for EFX. If we incrementally increase it for another desk, obviously that’s just another instance on the existing infrastructure, then it is more of the connectors in terms how they execute their trading.
5. It all depends on the users’ end-objective:

If real time dashboarding, not real time workflow, then it is something we have. The EFX team was exploring KDB over KX. We can also connect Tableau to KDB, but the caveat is any dashboard built in KX for daily BAU has to be replicated into Tableau.

In parallel, we are also checking if we can leverage ADA in terms of infrastructure to stream in data and use that real time dashboarding so the cost is minimized.

We also need to look at a data lake architecture, because for static data, they would only be present on batch data and not real time feeds.

1. The e-volume under Money Market and SGS is very low, as it is still going by the primary dealers.
2. We must be cognizant of a few topics:
   1. Data Delivery. What data does a desk need? E.g. Decision on client portfolio would require valuation up to that point, not up to yesterday point. That’s timeliness of data.
   2. Latency. It also impacts timeliness of delivery if something is required for market-making, etc. But latency is just a subset of items that we look at when we want something to have an output. E.g. market-making of US Treasuries definitely need low latency.
   3. Accuracy. Is data up-to-date. E.g. sales workbench trying to move from T+1 to T+0.
3. While Bill’s side don’t need streaming information, they require up-to-date dashboard views of customers, customer hit ratios, etc.
4. We should also store internal market-making data, so other desks can also make use of IRS, Swap, and money-market data. Our Northstar also has multi-asset engines. If we do an asset swap, swap data must be available real time for Ben to use.
5. Once we are able to collect the data, we can spot trends, and have the ability to predict / forecast. This is piggybacking on the current dashboards that we are building. Eddie is trying to ensure most of the data that is manually done by traders are put to the dashboard so they can displayed equally fast and reduce operational risk of manually transferring to Excel spreadsheets.

**Eddie 4**

1. Ben Davis’ price is just price, there is no need to calculate bond price. But for derivatives, there will be calculations for things like NPV, etc, there is no ability to make it realtime without scaling up computational capability, so realtime data might not be worthwhile.
2. In terms of real time data requirements, it is only market data, so no need to rebuild a delivery mechanism. Instead, we can build realtime data for what trades we have done, that’s the same complexity as Ben’s use case, but there is no value.
3. What is valuable to the derivatives desk is to know the current position realtime (within seconds, refreshable within seconds). Currently, if they want to know the entire position of the entire desk, it is a few hours, as there is Murex simulation / computation. While it might be brought down to 0.5 – 1 minute, doing this can come at a hefty costs.
4. It is also possible for Murex that regardless of computational power, it won’t give out the answer within 1 minute. Actually in a previous discussion with ITT, the derivatives desk’s computation load is only at 50%, so it cannot be due to insufficient servers.
5. Murex computation is slow because its architecture limits it to the speed of a single processor. We can do 5, 10, 15 minutes for segmented books, which is good enough.
6. Eddie will discuss with the tech guys for potential solutions and get back to Weisan.