

**From:** [Shmain, Jeffrey](#)  
**To:** [feedback@catnmsplan.com](mailto:feedback@catnmsplan.com)  
**Subject:** re: Bitemporal Nature of CAT  
**Date:** Thursday, December 20, 2012 4:58:36 PM

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Dear Sir or Madam,

We would like to take this opportunity to comment on the concept RFP document proposed by the SROs. Capgemini's Financial Services Global Business Unit currently employs 21,000 professionals worldwide and we service more than 900 clients. Our exposure to Capital Markets puts us in a unique position to observe the industry trends and pioneer the best practices. You can read more about our solutions and offerings at <http://www.capgemini.com/services-and-solutions/by-industry/financial-services/solutions/capital-markets/>.

We view CAT as a large Time-Series database, and, as such, would like to offer some feedback on the concept RFP document.

**1. It is essential for CAT to support the concept of Bitemporality**

The SRO's have already identified the need to maintain the raw data (uncorrected data) for five years. We think it is a step in the right direction. In addition to storing the data, there should be a way to access the data in bitemporal nature. One of the mandates of Rule 613 is having the ability to reconstruct the state market at any point of time. In addition to market reconstructions, the regulators must be able to easily reconstruct their view of the market at a specific point of time in the past. Since the data will be available one day after trades occurred, there may be a time when a regulator may initiate an investigation as soon as data is available. Based on the findings there may be some assumptions made, which will no longer hold true when the corrected data is posted. The regulator should easily go back and justify why the assumptions were made in the first place.

*Use Case:*

A regulator extracts the data for a particular market participant as a result of ongoing investigation. The regulator sees that most of the orders from this participant were routed to exchange XYZ and puts in a request for more information from exchange XYZ. After some period of time the participant submits the corrected data, as a result of which most of the orders were routed to exchange JKL (not XYZ). Sometime in the future exchange XYZ may inquire why it was asked for information if the participant never traded on that exchange. By having a fully bitemporal view of the database, a regulator will be able to reconstruct his understanding of the market state at any specific point of time and provide the justifications.

**2. Timestamp Granularity**

One of the initial requirements in RFP concept is to "Accept timestamps to the finest increment used by CAT Reporters if finer than the minimum increment required by the NMS Plan". While we acknowledge that there may be some benefit to preserving as much information as possible, we would like to point out a potential pitfall in this approach. If the timestamps are of different granularity between market participants, this may result in an inaccurate reconstruction of sequence of events. Some market participants may use this discrepancy to conceal a manipulative behavior. Therefore, we believe there is a greater benefit to standardize the granularity between all CAT reporters.

*Use Case:*

Firm A reports an order **09:30:00.300** – Buy IBM [1000@194.20](#)

Firm B reports an order 09:30:00.300100 – Buy IBM [10000@194.20](#)

Firm B reports a cancel at 09:30:00.300200 – Cancel IBM [10000@194.20](#)

Firm B reports a order at 09:30:00.300200– Sell IBM [1000@194.20](#)

Firm A reports to CAT in millisecond increment, while firm B reports in microsecond increment. If sorted by time, this looks like a legitimate sequence of events. However, it is impossible to ascertain the real sequence of events in this example. If Firm A really sent the order at 09:30:00.300110, than it is possible that it made that decision based on a huge Buy interest in the market, and the real sequence of events would be:

Firm B reports an order 09:30:00.300100 – Buy IBM [10000@194.20](#)

Firm A reports an order **09:30:00.300** – Buy IBM [1000@194.20](#)

Firm B reports a cancel at 09:30:00.300200 – Cancel IBM [10000@194.20](#)

Firm B reports a order at 09:30:00.300200 – Sell IBM [1000@194.20](#)

**3. Aggregations by Time Slices**

Most modern databases support some kind of time based aggregation. However, we believe that CAT should be much more flexible than a standard database. There should be a way for a regulator to easily run ad-hock queries that will aggregate the information based on configurable time slices.

*Use Case:*

In an ongoing investigation a regulator decides to see the total number of shares that a particular market participant traded in MCD throughout the day per hour. He then sees that between 11:00 – 12:00 there was an irregular spike in the trading activity for this participant in MCD. The regulator should have the ability to execute the same query between 11:00 and 12:00 in 15 minute increments. This will allow the SEC and SROs to have a high level view of any market activity and then zoom in on a time slice of interest.

| <b>1 Hour Increment</b> |        | <b>15 Minute Increment</b> |        | <b>1 Minute Increment</b> |        |
|-------------------------|--------|----------------------------|--------|---------------------------|--------|
| Time                    | Shares | Time                       | Shares | Time                      | Shares |
| 10:00:00                | 1000   | 11:15:00                   | 400    | 11:15:00                  | 100    |
| 11:00:00                | 4000   | 11:30:00                   | 315300 | 11:16:00                  | 200    |
| 12:00:00                | 320000 | 11:45:00                   | 4000   | 11:17:00                  | 1000   |
| 13:00:00                | 1000   | 12:00:00                   | 300    | 11:18:00                  | 311700 |
| 14:00:00                | 3000   |                            |        | 11:19:00                  | 300    |
| 15:00:00                | 4100   |                            |        | 11:20:00                  | 100    |
| 16:00:00                | 0      |                            |        | 11:21:00                  | 400    |
|                         |        |                            |        | 11:22:00                  | 200    |
|                         |        |                            |        | 11:23:00                  | 800    |
|                         |        |                            |        | 11:24:00                  | 100    |
|                         |        |                            |        | 11:25:00                  | 300    |
|                         |        |                            |        | 11:26:00                  | 100    |

We appreciate the opportunity to comment on the concept RFP document. We believe that by incorporating the suggestions above into the final RFP, SRO's will be able to drastically improve the effectiveness of the CAT system.

Sincerely,

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