

CELENT

MARKET SURVEILLANCE VENDORS

DAWN OF A NEW ERA

Anshuman Jaswal
09 June 2016

This is an authorized excerpt from a Celent report profiling market surveillance vendors. The reprint was prepared for Actimize, but the analysis has not been changed. For more information about the full report, please contact Celent at info@celent.com.

CONTENTS

| | |
|---|----|
| Executive Summary..... | 1 |
| Key Research Questions..... | 1 |
| Introduction | 2 |
| Key Research Questions..... | 2 |
| Product Profiles | 3 |
| NICE Actimize..... | 3 |
| Positioning of Surveillance Vendors | 5 |
| Conclusion | 7 |
| Leveraging Celent's Expertise | 9 |
| Support for Financial Institutions | 9 |
| Support for Vendors..... | 9 |
| Related Celent Research..... | 10 |

EXECUTIVE SUMMARY

KEY RESEARCH QUESTIONS

| | | |
|--|--|---|
| 1 <i>What are some of the main areas in which firms are developing their surveillance systems?</i> | 2 <i>What are the areas in which firms intend to undertake future development?</i> | 3 <i>How does the positioning compare for the product offerings of the leading firms?</i> |
|--|--|---|

MAR is a leading driver. Most of the vendors covered in this research stated that a lot of the recent development for their respective products was undertaken to meet the requirements for the Market Abuse Regulation about to be implemented in July 2016.

There is an emphasis on trying to understand the underlying intent for orders and trades. It is no longer sufficient for trading firms to provide information and analysis related to their orders. They have to go one level deeper to explain what the intention of a trader was in cases that there seems some possibility of market abuse or rogue activity. This means that all order-related data and communications have to be analysed in a relatively short timeframe.

Communication surveillance has come to the fore. More than ever, the analysis of electronic communications and voice data has become crucial. The established surveillance vendors have already entered or intend to enter into partnerships that, sometimes even acquire, firms that have the expertise to capture and analyse such information. Nasdaq's partnership with Digital Reasoning is a case in point.

Greater automation is inevitable. In most of the discussions, terms such as supervised and unsupervised machine learning, cognitive computing, artificial intelligence, and neural networks were frequently used. While compliance always requires a human element for analysis and making judgments based on available information, computing capability is required to process the vast amounts of structured and unstructured data.

Big Data technology is proving quite useful, but vendors have varying views on the usefulness and efficacy of Big Data technology. As the use of unstructured data increases, especially for communications surveillance and for analysing data for illiquid products, Big Data technology has more relevance and is being utilized by several of the vendors.

Cloud deployment is expected to become more popular. The cost-intensive nature of surveillance and the growing use of these products by smaller sell side and buy side firms mean that there would be greater use of cloud services in this field. Security is still a concern in this regard, but more and more firms are getting used to the idea. The push for greater buy side surveillance that is expected to be provided by MiFID II in 2018 will speed this process further.

INTRODUCTION

The market surveillance industry has made significant progress in the last few years. While the aftermath of the global financial crisis dampened growth of several other areas in capital markets, it has been a catalyst, and quite possibly a driver, for the expansion of market surveillance requirements of trading participants, venues, and regulators alike. Along with the recent regulatory focus on the intent of traders during the trade lifecycle, the large fines associated with Benchmark Manipulation have been instrumental in the development of communication and voice surveillance and the rise of a holistic surveillance approach. As a participant remarked during one of the discussions undertaken as part of the research, other than the significant interest (possibly even hype) around blockchain in the industry, market surveillance is the topic that is getting the most attention and attracting investment by industry players.

This report builds on Celent's research from 2015, when we came out with a series of four reports on market surveillance for exchanges, regulators, sell side, and buy side. Here the focus is on the recent trends that each of the 15 firms participating in the research would like to address, and we discuss the ways in which they are doing that. We also consider the areas for upcoming development which indicate the direction the industry is expected to take in the near future.

A change in the approach taken for this report from last year is that we chose to focus on the relevance of specific technological developments. Hence, the discussions underlined how firms are using machine learning, cognitive computing, and artificial intelligence capabilities as part of their research. We looked at the relevance of Big Data technology, and tried to understand which areas the vendors believed the technology could prove useful. We also spoke with the vendors about the degree to which cloud services have been adopted. What is quite interesting, and this is something the readers will see themselves, is the fact that there is a wide range of responses for each of these subjects. Some firms think that Big Data has been touted excessively, while others see it as central to their product strategy. Some do not believe that cloud computing has relevance due to data security concerns, while others already offer cloud deployment to their clients. Similarly, the use of machine learning differs; one area that was highlighted was the use of supervised versus unsupervised machine learning.

Market participants, venues, and regulators are all at different stages of adoption of surveillance technology. Often, the regulatory and legal requirements for a particular jurisdiction determine the degree to which surveillance must be undertaken and the means required for doing so. This is also reflected in the tools provided to their clients by the surveillance vendors. While there is disparity in this regard, what is also clear from the report is that there has been a lot of ground made in the last few years, and the concept of holistic surveillance underlines how thorough the approach of the regulators and leading sell side firms is. It involved combining the information gleaned from the myriad sources of data available to a trading firm or a regulator and then looking for patterns in the same.

KEY RESEARCH QUESTIONS

| | | |
|--|--|---|
| 1 <i>What are some of the main areas in which firms are developing their surveillance systems?</i> | 2 <i>What are the areas in which firms intend to undertake future development?</i> | 3 <i>How does the positioning compare for the product offerings of the leading firms?</i> |
|--|--|---|

PRODUCT PROFILES

NICE ACTIMIZE

Relevant Trends

- MAR and MiFID II are instrumental in their influence on the surveillance industry.
- Dodd-Frank requirement for OTC Derivatives surveillance and full trade reconstruction remains a challenge for firms.
- The fines and scandals, especially related to OTC, FX, and Benchmark Manipulation, indicate growing enforcement increasing in recent years and will drive surveillance capabilities.
- Regionally, there are higher standards being applied by FINRA, but there is also new regulation in APAC and other regions
- HFT has driven volumes and velocity of trades — volumes have increased significantly, along with new asset classes being traded electronically compared to before.
- Front office risk management and behavioural monitoring more critical.
- New regulatory guidelines are raising the bar — requirements to detect cross-product, cross-venue, and cross-market manipulation. From a compliance viewpoint, regulators are better prepared, the scale of fines is higher, and regulations are more granular and prescriptive in nature. The deadlines are tougher, such as MAR deadline of July 3, and there is greater enforcement of same. Also, electronic trading is becoming more complex, and illicit activity more sophisticated. Hence, the siloed approach used earlier is not working.
- There is a growing requirement for real-time or near real-time surveillance.

Recent Product Development

- NICE Actimize is combining actions with related intent within communications to capture both what was said and what was done. This involves looking not just at order executions but also positions, and being able to connect these to electronic and voice communications. They are working to provide a more predictive and preventive approach to surveillance rather than the reactive approach that was prevalent earlier.
- There is also an effort to show proof of compliance such as an audit trail, especially for regulatory purposes. It is using any type of data that might be relevant for regulatory and reputational risk, and is moving from a siloed to holistic approach for more accurate results.
- It is using predictive cross-channel analytics and detecting behavioural monitoring patterns through an anomaly detection engine and network analysis capabilities.
- NICE Actimize provides coverage for all asset classes and clients can choose level of coverage depending on their requirement. It engages in holistic surveillance, combining orders, trades, news, and alerts with electronic communication, voice, and social media. This uses native integration with the recording systems unlike other vendors. It also provides visualization and investigation of all this data, with full lifecycle of all orders. There is full trade reconstruction, which is important for both US and European regulators. Trade reconstruction is undertaken at the instrument, trader, and account level. It uses a fully automated process correlating communication with trades, which combines structured data with unstructured data through advanced analytics.
- The NICE Actimize markets surveillance solution provides information barriers / control room offering (refers to Chinese walls between different parts of the firm) to monitor any breach of Chinese walls or information barriers, for example, for insider dealing. This requires monitoring for intent, news sentiment analysis, coverage of multiple asset classes, advanced visualization, and statistical analysis of trader's activity in watch list/restricted securities.

- It has developed a specific package for addressing MAR requirements through collaboration with several top tier firms, and provides consistent coverage across all asset classes.

Cognitive Computing and AI

NICE Actimize is investing in these capabilities for predictive analytics. Its plan is to employ machine learning and AI in addition to the advanced multi-layered anomaly detection engine.

Role of Big Data Technology

There is enhanced detection by applying network analytics capabilities over big data. NICE Actimize is investing in Big Data technology to minimize costs and bring robust analytics. Its approach is to integrate own solution with clients' Big Data clusters and solution. This helps reduce client's total cost of ownership (TCO), allows for better analytics, real-time scalability and faster compliance assurance to regulators.

Cloud Computing

NICE Actimize provides a cross asset cloud solution for OTC and ETD products. It covers global regulations including MAR and provides the same case management capabilities that its Tier 1 customers use. The solution provides advanced analytics for each asset class, along with cross-asset analysis, real-time alerts for users and quick on-boarding for new clients. It also offers hybrid deployment to clients depending on the client's requirement, which has the same user interface for seamless transition. Hybrid clients are still a small percentage (5%) of the overall users at this time. There is a much higher percentage of clients for on-premise, but also a growing and significant share of cloud deployment.

Expected product enhancements

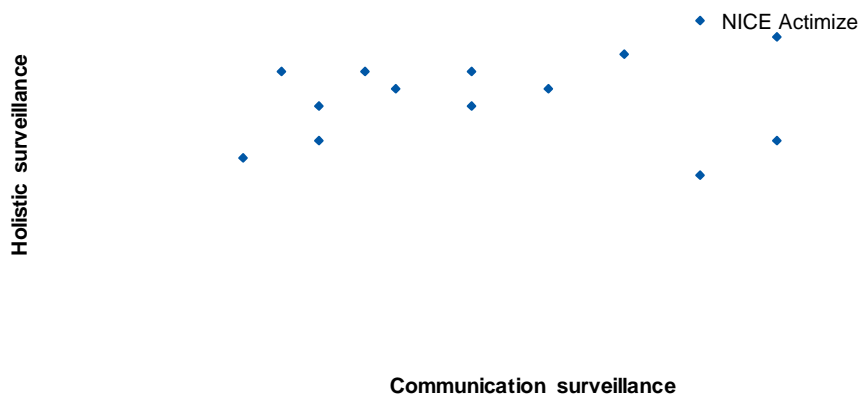
- NICE Actimize will continue to improve the holistic surveillance capabilities it offers including enhanced visualization & investigation, cross channel analytics, behavioural analytics, and network risk analytics.
- It is also working on an enhanced business intelligence offering that will enable business users to intuitively create and share visualizations and analyses and quickly gain insight for better decision-making.

POSITIONING OF SURVEILLANCE VENDORS

In this section we look at the positioning of the vendors discussed in the report with regard to four parameters which were considered most relevant, based on our discussions for this study with the various vendors and industry participants. These parameters are holistic surveillance, communication surveillance, machine learning capabilities and cloud services offered respectively. Holistic surveillance requirements and machine learning capabilities have really come to the fore in the course of the last year. Communication surveillance is also becoming more sophisticated to meet the complex requirements for sellside firms. Cloud services are becoming more important as these allow vendors to offer their products to clients in a more cost effective manner.

Figure 1 shows a positioning of the leading surveillance vendors in terms of their holistic surveillance and communication surveillance capabilities. Across the two parameters, some of the important vendors are Nasdaq, NICE Actimize, and Scila. Nasdaq has been boosted by its partnership with Digital Reasoning in this regard.

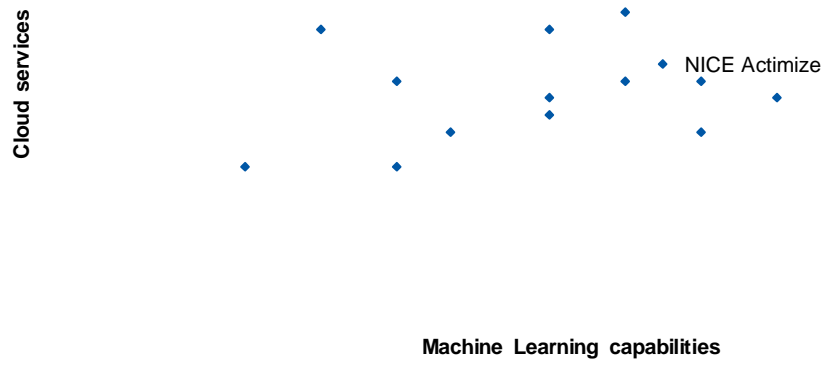
Figure 1: Holistic and Communication Surveillance Capabilities



Source: Celent analysis

With regard to the positioning for machine learning capabilities and cloud services in Figure 2, some of the notable vendors were Nasdaq, NICE, IBM, OneTick, and Ancoa. Most of these firms have significant Machine Learning capabilities, and are using cloud services to enable quicker deployment and better economy for their clients.

Figure 2: Machine Learning Capabilities and Cloud Services Offered



Source: Celent analysis

CONCLUSION

The market surveillance industry is in a very interesting and promising position at present. The advances made in technology in the areas of artificial intelligence, big data, cloud computing, and cybersecurity are all helping improve the surveillance capabilities on offer for market participants and regulators alike. The influence of recent regulations such as the Market Abuse Regulation and the use of litigation related to curtail market abuse in the US has also been significant in driving innovation and development of surveillance systems. The leading vendors are working on making their products more holistic in nature, and are open to partnerships or even acquiring firms to plug any gaps in their offerings.

The increase in speed and volumes in trading in recent years has been accompanied by ever more sophisticated cross-product trading strategies. These are also open to abuse, and hence it is up to trading firms, exchanges, and regulators to be able to detect any illicit activity. However, this is not an easy task, and for this reason, a lot of recent enhancements to surveillance systems have tried to capture the cross-asset and cross-market nature of rogue trading activity. The task is made more complicated by the fact that often the analysis is required in near real-time and in significant detail to meet the compliance and regulatory standards. Vendors are well aware of the fact that the growing need for investment in surveillance is coming at a time when most firms are not performing as well financially as they used to before the crisis. Hence, they are trying to come up with ways in which the surveillance requirements can be met more cost-effectively. Different vendors have different strategies. We are no longer operating in an environment in which it is sufficient to improve the product functionality; it is also important to take the cost of implementation and ongoing maintenance into account.

There has been a tangible improvement in the communication and voice surveillance capabilities of several vendors since our last report a year ago. Vendors are addressing the need to improve their functionality in this regard both in-house and through partnerships. The ideal product is one which seamlessly overlays the data from trade and order surveillance with that from communication surveillance to allow the compliance personnel or the regulators to be able to analyse all the available information simultaneously. While some firms are claiming that they are able to do so already, there is some way to go in terms of the progress being made by the industry overall.

Cloud deployment of surveillance systems is going to become more popular in the next few years. Again there is a variance in the approaches and capabilities of firms. Some already provide cloud deployment, others have more of a wait and see approach due to the security concerns that some market participants have. But it is clear that cloud services have significant advantages, especially when we consider the mid- and small-sized buy side and sell side firms. It is more economic to use cloud services, and they also allow firms that do not have large IT teams to be able to meet their surveillance requirements.

Another area firms are making progress is the use of machine learning and artificial intelligence functionality. As we deal with ever growing volumes of data and rising trading complexity, the use of supervised machine learning, and unsupervised machine learning in the more advanced cases, will certainly make it simpler to handle the onerous compliance and regulatory needs. As some vendors underlined, the nature of the compliance function is such that some level of supervision would always be required. However, the rapid advances in artificial intelligence capabilities would continue to be of interest in the future as trading participants try to meet their surveillance needs in a more economical and streamlined fashion.

We now look at the ongoing role for big data technology. For some vendors, it is seen as being more hype than anything else. But several vendors also stated how critical it is to their operations, particularly as they have to deal with ever rising volumes of unstructured data for the purpose of communication surveillance. Big data capabilities provide a faster means to analyse vast amounts of data. The technology has an important role to play in conjunction with cloud computing and machine learning in the field of surveillance. As one vendor pointed out, most of the activities of surveillance systems utilize big data capabilities in one way or another. Hence, in its various forms, the technology is here to stay.

The leading market surveillance systems today have more sophisticated analytics, visualization, and dashboards. The approach to surveillance has also changed and is more holistic than ever before. The function is also combined more often with other requirements of the compliance department of a firm, such as the GRC, best execution, AML/KYC, and cybersecurity. For the near future, the requirements for surveillance systems would be driven by key regulations such as MAR and MiFID II, while the capability to meet these requirements would be a factor of the technological developments in areas such as artificial intelligence, cloud computing, and big data. An interesting element might be the manner in which industry regulators and participants choose to deal with blockchain technology as it becomes more mainstream. As one participant commented, blockchain does not readily lend itself to surveillance due to the anonymity of data and the use of encryption. Once the regulators are on board, private blockchains that address specific industry requirements would have to be created in a way that they allow for the use of surveillance technology. That would be another challenge the surveillance industry has to overcome in the next few years.

Was this report useful to you? Please send any comments, questions, or suggestions for upcoming research topics to info@celent.com.

LEVERAGING CELENT'S EXPERTISE

If you found this report valuable, you might consider engaging with Celent for custom analysis and research. Our collective experience and the knowledge we gained while working on this report can help you streamline the creation, refinement, or execution of your strategies.

SUPPORT FOR FINANCIAL INSTITUTIONS

Typical projects we support related to market surveillance include:

Vendor short listing and selection. We perform discovery specific to you and your business to better understand your unique needs. We then create and administer a custom RFI to selected vendors to assist you in making rapid and accurate vendor choices.

Business practice evaluations. We spend time evaluating your business processes. Based on our knowledge of the market, we identify potential process or technology constraints and provide clear insights that will help you implement industry best practices.

IT and business strategy creation. We collect perspectives from your executive team, your front line business and IT staff, and your customers. We then analyze your current position, institutional capabilities, and technology against your goals. If necessary, we help you reformulate your technology and business plans to address short-term and long-term needs.

SUPPORT FOR VENDORS

We provide services that help you refine your product and service offerings. Examples include:

Product and service strategy evaluation. We help you assess your market position in terms of functionality, technology, and services. Our strategy workshops will help you target the right customers and map your offerings to their needs.

Market messaging and collateral review. Based on our extensive experience with your potential clients, we assess your marketing and sales materials — including your website and any collateral.

RELATED CELENT RESEARCH

Market Surveillance Systems for the Sell Side and the Buy Side
September 2015

Market Surveillance Systems for Exchanges: A Look at the Leading Products
June 2015

Market Surveillance for Sell Side and Buy Side: Driving Strategic Insights
May 2015

Market Surveillance Systems: A Must-Have for Risk Mitigation
May 2015

Copyright Notice

Prepared by

Celent, a division of Oliver Wyman, Inc.

Copyright © 2016 Celent, a division of Oliver Wyman, Inc. All rights reserved. This report may not be reproduced, copied or redistributed, in whole or in part, in any form or by any means, without the written permission of Celent, a division of Oliver Wyman ("Celent") and Celent accepts no liability whatsoever for the actions of third parties in this respect. Celent and any third party content providers whose content is included in this report are the sole copyright owners of the content in this report. Any third party content in this report has been included by Celent with the permission of the relevant content owner. Any use of this report by any third party is strictly prohibited without a license expressly granted by Celent. Any use of third party content included in this report is strictly prohibited without the express permission of the relevant content owner. This report is not intended for general circulation, nor is it to be used, reproduced, copied, quoted or distributed by third parties for any purpose other than those that may be set forth herein without the prior written permission of Celent. Neither all nor any part of the contents of this report, or any opinions expressed herein, shall be disseminated to the public through advertising media, public relations, news media, sales media, mail, direct transmittal, or any other public means of communications, without the prior written consent of Celent. Any violation of Celent's rights in this report will be enforced to the fullest extent of the law, including the pursuit of monetary damages and injunctive relief in the event of any breach of the foregoing restrictions.

This report is not a substitute for tailored professional advice on how a specific financial institution should execute its strategy. This report is not investment advice and should not be relied on for such advice or as a substitute for consultation with professional accountants, tax, legal or financial advisers. Celent has made every effort to use reliable, up-to-date and comprehensive information and analysis, but all information is provided without warranty of any kind, express or implied. Information furnished by others, upon which all or portions of this report are based, is believed to be reliable but has not been verified, and no warranty is given as to the accuracy of such information. Public information and industry and statistical data, are from sources we deem to be reliable; however, we make no representation as to the accuracy or completeness of such information and have accepted the information without further verification.

Celent disclaims any responsibility to update the information or conclusions in this report. Celent accepts no liability for any loss arising from any action taken or refrained from as a result of information contained in this report or any reports or sources of information referred to herein, or for any consequential, special or similar damages even if advised of the possibility of such damages.

There are no third party beneficiaries with respect to this report, and we accept no liability to any third party. The opinions expressed herein are valid only for the purpose stated herein and as of the date of this report.

No responsibility is taken for changes in market conditions or laws or regulations and no obligation is assumed to revise this report to reflect changes, events or conditions, which occur subsequent to the date hereof.

For more information please contact info@celent.com or:

Anshuman Jaswal

ajaswal@celent.com

AMERICAS

USA

200 Clarendon Street, 12th Floor
Boston, MA 02116

Tel.: +1.617.262.3120
Fax: +1.617.262.3121

USA

1166 Avenue of the Americas
New York, NY 10036

Tel.: +1.212.541.8100
Fax: +1.212.541.8957

USA

Four Embarcadero Center, Suite 1100
San Francisco, CA 94111

Tel.: +1.415.743.7900
Fax: +1.415.743.7950

Brazil

Av. Doutor Chucri Zaidan, 920 –
4º andar
Market Place Tower I
São Paulo SP 04578-903

Tel.: +55.11.5501.1100
Fax: +55.11.5501.1110

Canada

1981 McGill College Avenue
Montréal, Québec H3A 3T5

Tel.: +1.514.499.0461

EUROPE

France

28, avenue Victor Hugo
Paris Cedex 16
75783

Tel.: +33.1.73.04.46.20
Fax: +33.1.45.02.30.01

United Kingdom

55 Baker Street
London W1U 8EW

Tel.: +44.20.7333.8333
Fax: +44.20.7333.8334

Italy

Galleria San Babila 4B
Milan 20122

Tel.: +39.02.305.771
Fax: +39.02.303.040.44

Spain

Paseo de la Castellana 216
Pl. 13
Madrid 28046

Tel.: +34.91.531.79.00
Fax: +34.91.531.79.09

Switzerland

Tessinerplatz 5
Zurich 8027

Tel.: +41.44.5533.333

ASIA

Japan

The Imperial Hotel Tower, 13th Floor
1-1-1 Uchisaiwai-cho
Chiyoda-ku, Tokyo 100-0011

Tel: +81.3.3500.3023
Fax: +81.3.3500.3059

China

Beijing Kerry Centre
South Tower, 15th Floor
1 Guanghua Road
Chaoyang, Beijing 100022

Tel: +86.10.8520.0350
Fax: +86.10.8520.0349

Singapore

8 Marina View #09-07
Asia Square Tower 1
Singapore 018960

Tel.: +65.9168.3998
Fax: +65.6327.5406

South Korea

Youngpoong Building, 22nd Floor
33 Seorin-dong, Jongno-gu
Seoul 110-752

Tel.: +82.10.3019.1417
Fax: +82.2.399.5534