Overview

March 2021

About Janes

Janes provides insight in a complex world. We are a global open-source intelligence organization, focused on providing our clients with the highest levels of foundational intelligence, operational data, and tactical knowledge to accomplish their mission. Many know us from our past 123-year history as a publisher and provider of rich military equipment intelligence. Today, we are a technology-enabled, data-led organization providing assured, optimized data to meet mission needs.

Our approach is based on a unique philosophy, team structure and process that combines rich open-source research & analysis, interconnected assured data, and optimized data enrichment. For customers, we provide compelling innovations which simultaneously solve for both the unmet needs of the OSINT analyst, and the strategic, operational, and tactical needs of the organization.

Our global experience has shown that our unique approach of blending our assured Janes content with both client and third-party data sources dramatically improves the probability and speed of getting critical information into the hands of decision makers in a reliable, repeatable, and scalable manner.

Our obsession with delivering solutions to modern warfighters is embodied in a commercial model that provides customers with a cross-functional team of OSINT experts, data scientists, product specialists, and innovation professionals. This approach means we can adapt to rapidly changing mission priorities, adopt new technologies, and deliver interoperable solutions.

Being outcome-obsessed we forge a deeper partnership with our clients based on a shared urgency to get to real outcomes. Our approach to all-aspect OSINT was forged from two core truths we believe to be at the heart of the OSINT industry today.

OSINT data volume and velocity continues to accelerate while monitoring platforms fail to provide necessary context, leaving analysts spending time on low value tasks.

Brilliant, analytically based innovation strategies quickly fail if they aren't backed by the creative spark to synthesize tangible, compelling offerings to ignite the marketplace and mobilize the organization to adapt and change in challenge environments.

Intelligence analysts and warfighters need trusted OSINT data that is timely, assured, and connected. They need modern solutions they can count on.

Janes' approach was purpose-built to be the antidote to these pitfalls, and a catalyst to the outcome we all want: OSINT information delivered for actionable outcomes.

The Future of Janes Open-Source Intelligence

THE JANES PERSPECTIVE

There has never been a more important time for the application and operationalization of open-source intelligence. The digital age has brought about an explosion in both data velocity and volume, while in tandem drastically reducing the computing costs needed to make sense of such large amounts of information. Data that was previously only able to be captured by state actors, such as satellite images, signals intelligence, and highly-personalized information regarding social media users, is now readily available on the open market.

These changes have increased the possible value that OSINT holds for intelligence consumers, but also come with risks. Information readily available is not assured; it can be manipulated, may not be true, may be duplicative, and may be misleading. Janes maintains our relevancy in a world awash in information by providing assured, optimized data to our clients. But assured, we are referring to the information being trusted through our human-centric analytic tradecraft. By optimized, we mean delivered in a way that is timely, relevant, accurate, complete, and assured for their needs. We at Janes call this TRACS, which serves as our model for client delivery in a rapidly expanding OSINT universe.

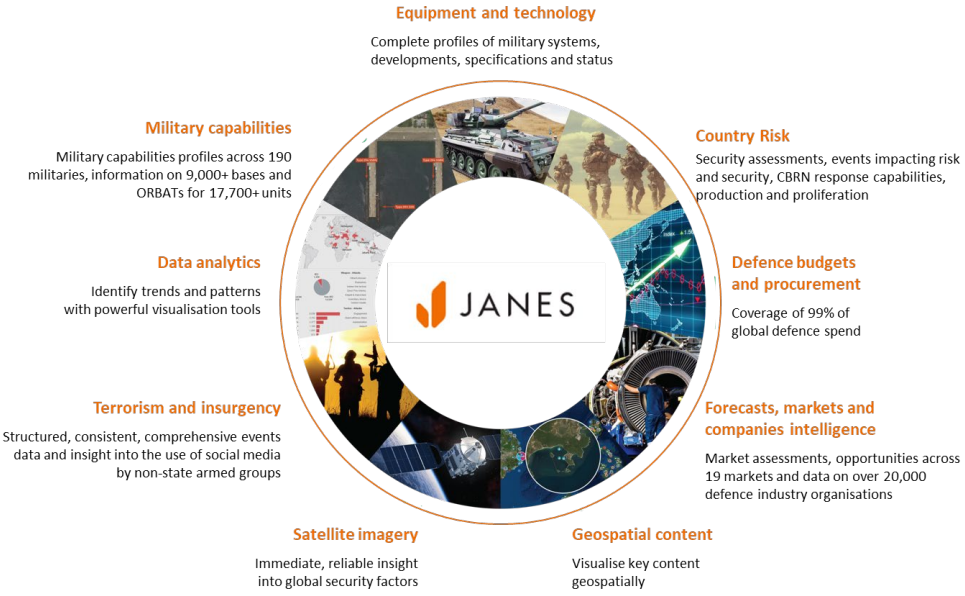
SITUATION REPORT

Open-source data volume and velocity continues to accelerate while platforms to monitor and integrate OSINT fail to provide the ability to interrogate the data in an efficient and contextualized fashion. Intelligence analysts and warfighters not only need, but require trusted OSINT data that is timely, assured, and connected to reduce the time spent on discovery and increase focus on interpreting the "so what" of the information collected. But despite recommendations for using commercial off the shelf tools and supporting tradecraft methodology for processing OSINT data, the US Intelligence Community has expanded, staffed, and created policies directed towards collecting classified data ignoring data easily obtained from a trusted open source provider. As the global and information environment continues to shift, new sources of data and dissemination outlets are created daily challenging classified collection systems—let alone the policy—to keep pace. From tradecraft and collection, to policy and regulation, publicly available information and leveraging OSINT data has been at the epicenter of discussion—further elevated in importance as the IC pivoted to ensure continued operations in a disconnected work environment dictated by the COVID-19 global pandemic.

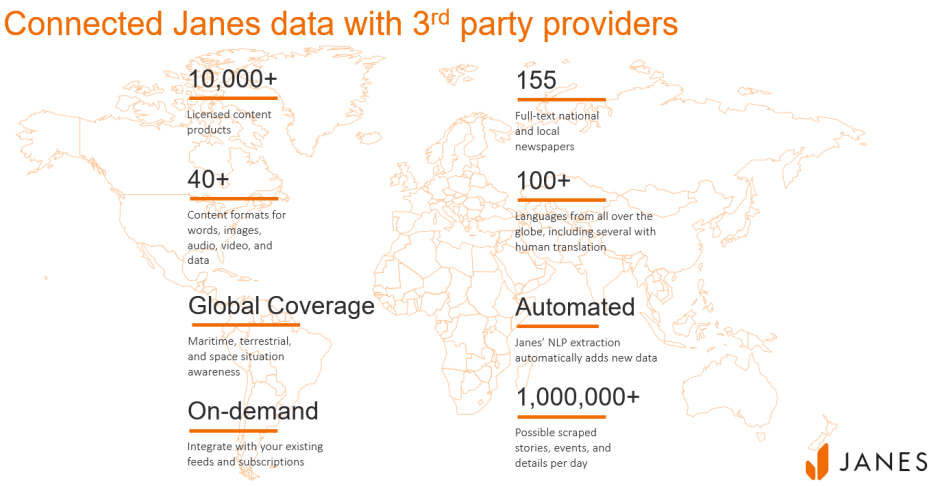
The need for data to help anticipate events and changing environments is growing at a rate that outpaces the acquisition ability of the USG. More and more organizations are turning towards private industry to help direct and employ precious resources in search for better information, tools, and process to answer these questions. In the most recent article published by former DDI, Carmen Medina, she so poignantly states, "Our information climate has changed, irrevocably, in ways that challenge the work of intelligence agencies and even the legitimacy of national governments. Individuals are able to sluice and direct information streams–however they want–to construct whatever narrative suits their biases and preferences. What results are hundreds of "Truth Networks" that self-perpetuate and resist authoritative rebuttals. Conclusions drawn by intelligence agencies are no longer the final or convincing word." (Cipher Brief, Carmen Medina)

Janes as an open source intelligence organization is able to provide the next level of open source intelligence; validated open source from which customer can create a trusted common framework to initiate discussions on the deeper capabilities of a nations force from its inventory to procurement markets. Using this as the nucleus to optimize other OSINT data feeds can serve to transform the way in which the IC can both approach the utility of OSINT but also optimize the interaction with the data connections. Janes data and data model framework offers a structure, tradecraft and brand that advances the speed of trust built between the user and information environment. This open collection of validated data holdings naturally alleviates the pressure on analysts to weed through troughs of open source searching for initial answers to intelligence questions such as, "What events have or will occur that lead to shifts in country stability? What are my adversaries capable of doing?

What are they buying to support their capabilities? With over 400,000 validated events, 700 new events daily, 83,000 pieces of military equipment, 350,000,000 total data points added each year, and a wide range of additional information.



Janes has undertaken development of a prototype platform aimed at integrating OSINT using Janes foundational military intelligence data points as the nucleus from which to start connecting and integrating multiple data streams together. Development of this prototype seeks to integrate data in the open domain to reduce the time to discovery and maximize the contextual output of the analytic judgement.



THE OSINT CHALLENGE

The amount of the newly created data in 2020 was predicted to grow 44X to reach 35 zettabytes (35 trillion gigabytes). Two years ago, we were already at 33 zettabytes, leading IDC to predict that in 2025, 175 zettabytes (175 trillion gigabytes) of new data will be created around the world.

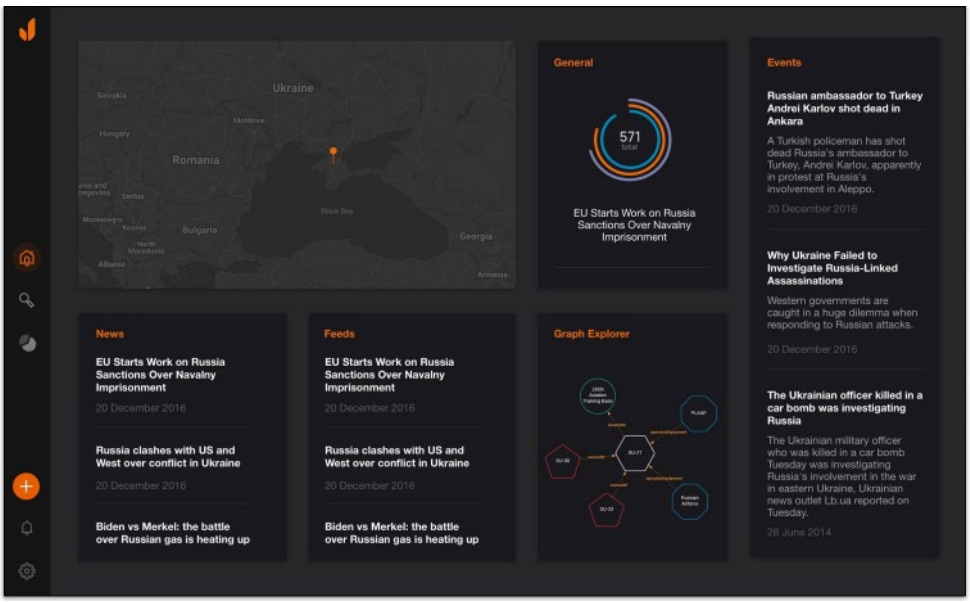
For the past 2 decades, the US defense and intelligence resources have been focused heavily on the counterterrorism and defense of homeland from violent extremism mission set. The community amassed and sustained collection, operations, analysis and in addition to acquisition of systems to process massive amounts of disparate data ripped from the battlefield. Because DoD resources focused on an asymmetric war, personnel and collection assets were not prioritized to gather and connect content on global foreign military capabilities which resulted in gaps and losses in both intellectual and data repositories on foundational military intelligence data sets. But now with overseas violent extremism declining in US priority and increasing focus placed on global nation state near peer adversary capabilities, coupled with a renewed focus on domestic extremism, the need to collect and process information at speed and scale is critical. Classified collection systems are not prioritized or able to collect these data sets in a timely shareable fashion which further emphasizes both the need and value OSINT brings to fill intelligence gaps quickly.

WHY DOES THIS MATTER?

With national security strategic requirements shifting towards the Great Power Competition—largely focused on proliferation of capabilities of China and Russia—the US and Defense Intelligence Community are finding themselves faced with not only gaps in the ability to collect foundational military capabilities information, but gaps in the intellectual capital needed to process, interpret and contextualize this in an evolving geopolitical environment. To immediately address those gaps, we are routinely sought as the OSINT provide delivering an accessible form of information that meets customer needs quickly and can be moved to classified systems for further validation when required. Serving as the "tip of the spear" for trends in social, geopolitical, and economic shifts globally, open source data can be quickly curated and shifted to a classified environment for further interrogation. When done in a structured and connected way, OSINT becomes the first line of collection for tipping and cueing of critical changes in environments in near real-time. Because OSINT inherently creates a common shareable foundation from which to hold conversations with non-traditional organizations, governments and agencies are relieved of declassification requirements enabling them to take action faster. But it is not enough to just leverage data in the open-source environment, but rather there is a need to automate discovery.

WHERE JANES IS BUILDING

Janes is transforming ourselves into a mission-critical OSINT data provider. Building on our 123-year-old legacy providing assured content, we have since structured our organization around the development and delivery of assured, optimized, and machine-enabled data feeds.



At the center of our solutions is Janes assured data and the connected Janes Data Model. This dataset encompasses more than 350 million connected data points, ranging from equipment, to supply chain, to financial information, or order to battle, to weapons capabilities, to non-state actors, and more. In addition, over 700 events are published daily through Janes, augmenting our existing data feeds in a dynamic manner.

Over the past year, architected our data into a connected data model. Every named entity in Janes is tagged, labeled, and associated within the intelligence context it operates in. Located on a graph database architecture and powered by AI/ML human-machine teaming elements, Janes connected data solutions provides a single source of assured and contextualized content for the vast open-source intelligence universe.

Building off our connected data model and assured content, Janes has built a suite of highly-scalable data integration, normalization, visualization, and analytic capabilities to become a source of All-Aspect open-source intelligence. Janes is able to rapidly ingest massive amounts of data while simultaneously mapping these feeds against our data model, providing real-time enrichment of content and giving analysts with a single source of OSINT context.

Open-Source Intelligence Technology Challenges and Janes Solutions

THE STATE OF PLAY

Emerging technologies are rapidly reshaping how intelligence organizations gather, process, and evaluate information. These changes are likely to have a profound impact on the usefulness, and therefore importance, of open-source information. Driving these changes are four technology trends, summed up as:

Distributed Compute. The ability to store, process, and analyze massive amounts of data is foundationally changing the ability for organizations to collect far more data than previously. This trend is powered primarily by the relatively low cost of graphics processing units (GPUs) which power a significant amount of data science and AI/ML capabilities.

AI/ML. The ability to store information, above, results in the ability to provide applications including artificial intelligence and machine learning, including computer vision, natural language processing, anomaly detection, predictive analyses, and other applications.

Ubiquitous sensing. The ubiquity of sensors, ranging from commercial satellites to a personal cell phone, means there is more data today on every aspect of life than every before. Intelligence organizations must be able to collect, process, and analyze disparate information that is open-source by design and providence. This goes against the grain of commonly practiced OSINT procedures, which placed OSINT as a stand-alone, unconnected entity. However, as OSINT accelerates into data types historically occupied only by

TODAY IS NOT YESTERDAY

In the past, it was standard practice for intelligence organizations to utilize classified remote sensing and clandestine reporting as core inputs to their analytical tradecraft. The primary purpose of utilizing such capabilities was to both protect the sources and methods of information, while also utilizing advanced technology capabilities not accessible to the general public or commercial industry. However, although such reporting is typically high quality, over reliance on classified sources can delay critical information being provided to decision markers while also increasing the overall cost of collection.

Today OSINT can provide analysts, and their policy-making intelligence customers, with information once only available to nation states through classified means. The commercial sector's rapid adoption of technology and relentless pursuit of faster, better technologies give it an advantage over classified sources in assessing fast moving events, such as spontaneous mass protests, outbreaks of disease, or even military movements and operations. Analysts can pair the rapid information from OSINT against their classified sources to provide a rich complete picture before critical decisions, but must harness the power of OSINT to avoid falling behind dynamic situations.

THE CENTRALITY OF OSINT

Rapid changes in OSINT's ability to capture timely, relevant, accurate, and critical information is catalyzing increased focus on the open-source ecosystem. Unlike in the past when OSINT was generally thought to be a backwater of intelligence organizations, it is increasingly viewed as a cost-effective way to deliver mission critical information.

The challenge, however, remains in the assurance of such information. Here, Janes has an outsized advantage to deliver assured OSINT. Our analytic tradecraft is based on first assuring information, prior to optimizing it for use. Janes OSINT COP is designed to harness the assurance capabilities of Janes, while also allowing analysts to utilize all-aspect open-source intelligence in an optimized, human-machine enabled manner to meet their mission needs.

At Janes, we believe that our clients stand to greatly benefit from the integrate OSINT into analytic processes and tradecraft. Analysts should view OSINT as a foundational "INT" alongside traditional

proprietary intelligence collection in informing and driving analytic judgements. OSINT is the area where application of AI and ML can show early success, largely because OSINT is so vast and so in need of careful curating.

Here is where Janes' unique position within the OSINT ecosystem as the provider of assured, optimized information is key. As a matter of corporate ethos, we curate our data with humans in the loop, enabling the use of trusted OSINT, while using this underlying data and associated data model to enrich internal and external data sources.

A key objective in raising the importance of OSINT is to enhance the timeliness and relevance to policymakers and to understand what they may already have absorbed from independent access to open-source data so as not to duplicate that in reporting. Analysts should focus on integrating what they learn from open sources with other aspects of big data and with secret intelligence to produce the most complete picture of adversary plans and intentions.

CULTURE SHIFT

In order to fully capture value from OSINT exploitation, a cultural shift must take place inside intelligence organizations. Too often, intelligence professionals and organizations fall into a pattern of over indexing on proprietary collection resources. This excludes OSINT alternatives, at times for good reasons, including provenance and associated confidence intervals. However, by nearly always defaulting to proprietary resources, intelligence organizations miss the opportunity to lower their costs, increase their collection speed, and utilize emerging technologies more rapidly. Incorporating OSINT into the intelligence cycle and making it a mission-critical element will take a cultural shift in this thinking.

It is important t note that Janes believes that proprietary collection, analysis, and distribution capabilities are critical for intelligence communities to retain. We believe however, that systematic exploitation of OSINT will reduce costs and demands on clandestine collection, freeing up those resources to fill persistent intelligence gaps.

Janes is addressing these concerns at several levels, including our assurance tradecraft, OSINT training, and ongoing support for clients.

OSINT ACROSS THE INTELLIGENCE CYCLE

OSINT is a powerful tool across the intelligence cycle. For the sake of brevity, we have collapsed the intelligence cycle into **collection**, **analysis**, and **distribution**. The following details the challenge facing the OSINT ecosystem and intelligence customers, while highlighting the steps Janes is taking to solve these challenges.

OSINT COLLECTION

OSINT collection can dramatically reduce costs, increase collection speed, and incorporate new collection capabilities more rapidly than reliance on clandestine capabilities alone. Furthermore, by leveraging the full ecosystem of OSINT, the DSC can free up resources to focus on persistent gaps. Advanced technologies including AI, advertising technologies, multimodal sensors, cloud computing, and advanced analytics can be used automate how platforms are selected and tasked, sharpen and specify what is collected, and tailor processing tasks to user needs.

Areas of focus for advances in OSINT collection include:

Automated Tasking.

AI/ML and automated tools can assist in automating, planning, and scheduling collection across a wide range of OSINT resources. Examples include automated tasking of commercial remote sensing, adaptive tasking of commercial space assets, anomalous activity detection for commercial ISR and/or advertising technology, and autonomous web-scrappers for online content.

Janes provides both initial and ongoing technical configuration for OSINT COP customers, building automated collection capabilities across both Janes data feeds as well as third-party and client sources.

Automated processing.

Advances in automation, including but not limited to AI/ML, advanced heuristics, and graph data architectures, can automate, expediate, and streamline the processing, linking, and contextualization of the volume and velocity of OSINT data streams. For example, natural language processing can rapidly extract named entities from massive text sources, matching these against a knowledge graph of linked entities. Computer vision meanwhile can process streams of images, either geospatial, arial, or remote sensing, and perform human-like tasks including recognition and categorization. Other natural language processing applications, such as speech-to-text for transcription and/or translation of open-source signals.

At Janes, we always look to augment intelligence with machines. We have made great strides directly incorporated AI/ML frameworks, including natural language processing, to automatically ingest, normalize, and link information across the Janes data model. This provides a single source of assured trust for the OSINT data universe, which in turn provides context to analysts at machine speed.

OSINT ANALYSIS

The explosion of OSINT data, coupled with advances in computing power and associated technologies, can rapidly accelerate policymaker cycles and speed up the intelligence cycle. How well and how rapidly organizations including the DSC incorporate these new data sources and technologies into their all-source analysis will be vital to their ability to generate timely, relevant, and accurate intelligence products. Within analysis, there are many opportunities to augment analysts' ability to deliver high-level and value-added intelligence to customers using these new data sources, processing capabilities, and analytic engines. However, there are also a wide range of barriers to the successful application of these analytic tools, due to the underlying data, algorithms, and, ultimately, the ability of analysts to understand and successfully apply these tools to make sense of the vast range of OSINT information.

Analytic technologies can help optimize OSINT flows; automate mundane but vital processing tasks; augment analysts' sensemaking and critical thinking skills; and even perform certain types of analysis. Emerging technologies, including anomaly detection and predictive analysis, assist analysts to make sense of exponentially growing data, unlock new insights to inform judgments, and create more strategic bandwidth for analysts to think and write strategically.

Anomaly detection.

Automated systems can readily understand baseline status in large amounts of unstructured, semi-structured, and structured OSINT data. Outliers in this data, whether it is an uptake in manufacturing from a Chinese facility, a large order of equipment in Russia, or the deployment of a squadron to a forward base, can be flagged for analyst review rapidly. This is especially true for the rapid flagging of early warnings of events, such as a repositioning of troops within a contested geography, that can be flagged before the event takes place. Having

Janes is able to provide an assured, baseline strategic intelligence environment from which to detect anomalous activity. Our assured data is interconnected, meaning that anomalies can not only be flagged for review, but reviewed in the context in which they are most relevant.

Pattern recognition and predictive analysis.

OSINT's variety, volume, and velocity is well suited for advanced analytics for pattern recognition and sensemaking as part of the analyst workflow. Analysts can leverage advanced analytics, including deep learning algorithms to identify patterns and trends in OSINT data streams, make inferences on relationships between OSINT datapoints, and visualize networks for augmented situation awareness. As AI tools progress, the back-end result of better data processing can be better and automated data sensemaking delivered in digestible and actionable forms for OSINT analysts.

Janes is actively prototyping new methodologies to provide pattern recognition and build predictive analyses off of our data. Janes assured content, paired with additional client and third-party sources,

provides a concrete dataset to build from to support predictive functions. In addition, we are building advanced data analytic packages that can be configured to meet client needs.

Optimizing OSINT Data Flows.

Advances in technology, including machine automation and AI/ML, can help surface the most relevant and useful information to analysts' ever-growing "traffic" queues—from the wide range of OSINT sensor data, news information, and foundational intelligence available. Recommendation algorithms can be used to prioritize these feeds to make the most relevant and timey information appear for an analyst, while anticipating and predicting their needs based on analytic activity.

Janes is building predictive capabilities to optimize both our internal OSINT analytical workflows, while also providing clients with data feeds optimized for their needs. We are also building advanced search capabilities that prioritize the most relevant data for analysts.

OSINT DISTRIBUTION

Emerging technologies can help transform not only the creation of OSINT products, but also how these products are delivered to the DSC's clients including policy makers and uniformed service members. Beyond product dissemination, cloud and AI tools can help transform how OSINT is shared and delivered more broadly between analysts, organizations, and allies to distribute vital knowledge and inform decision making.

User-defined knowledge bases.

Modern digital technologies, including flexible knowledge graph architectures, provide analysts with the ability to capture, tailor, and update standing assessments and operating pictures of importance to their customers, with clear exposition of the reporting and content driving those judgments. Automated capabilities, including AI/ML models, can in time recommend reporting to include as analysts build their brief and be automated over time to self-update with new intelligence. These knowledge bases mean that analysts can create tailored analytic environments, capturing critical OSINT information without needed to scan all available, but unlikely to be actionable, feeds, while linking information together.

Janes' user-defined dashboard capabilities enable analysts and teams to create, share, and visualize knowledge bases unique to their needs.

Rapid dissemination.

Once anomalies have been detected or patterns emerge, getting this OSINT information into the hands of analysts and decision markers can be automated and optimized. For decisionmakers who are using OSINT as part of their assessment inputs, AI/ML and cloud computing can enable automated and targeted delivery of critical, time-sensitive intelligence to users with "need to know" based on their attributes (e.g., rank, role, and location).

Janes user communities for our next-generation products include analysts, section chiefs, and decision makers. Alerts can be created that automatically flag critical OSINT patterns and data to those who need to know.

Extended customer base.

OSINT data, by its very nature, enables greater collaboration with external partners, commercial enterprises, and allied nations. OSINT is more sharable, collaborative, and flexible than proprietary sources which in turn can result in greater coordination between organizations.

As a global organization, Janes seeks to encourage OSINT collaboration when possible to achieve mission needs.

Customizable views.

Modernized software, including web-accessible interfaces, can be modular, user-defined, and dynamic. Customization allows analysts to optimize their experience to best suit their mission needs, leading to faster intelligence product creation and dissemination.

At Janes, we are providing users of our OSINT COP with access to modular, customizable dashboards to optimize each experience to that individual user.

JANES HUMAN-MACHINE TEAMING

The future of an integrated OSINT COP requires augmenting human analytic power with machine speed, processing power, and insights. Combining humans with machine power enables analysts to free up valuable time in which to perform deep analysis, as opposed to data collection, normalization, and curation. Augmenting open-source intelligence with machines is core to Janes vision to provide timely, relevant, accurate, complete, and assured OSINT information in an optimized manner.

Limitations.

There are significant limitations and barriers that must be overcome to achieve this human-machine teamed vision. The complex tradecraft of OSINT analysis depends on rigorous processes and clear explanations and reasoning of the logic, evidence, assumptions, and inferences used to reach conclusions. The intricacies of strategic analysis, involving the role of informed human judgments, and requirements for transparency and assurance pose real challenges for modeling analytic processes and practical limits to applications applying automated systems to analysis. Moreover, the current brittleness, opaqueness, and limited traceability of AI/ML and the bias common in certain algorithms and models will also constrain AI/ML's applicability and usability in the OSINT analytic processes.

Further, while analysts must be able to both trust the efficacy of algorithms, they also must have the baseline skills needed to effectively utilize these new capabilities. Today, analysts with analytical tradecraft and technologists capable of leveraging advanced analytics and capabilities to unlock OSINT value are kept separate and siloed in different parts of the organization.

To answer these challenges, Janes OSINT COP includes both OSINT practitioners and technologists as part of our ongoing product enabled services.

THE NEED FOR ASSURANCE & OPTIMIZATION

The use of OSINT as a core component of a common intelligence picture has speed, cost, and shareability benefits. At the same time, effectively leveraging OSINT also requires, and therefore forces, organizational innovations and the rapid adoption of emerging technologies. The combined benefits of having an OSINT COP as part of a common intelligence picture therefore leads to largescale modernization and ongoing digital transformations by the intelligence organization.

However, many intelligence professionals continue to view the OSINT universe with skepticism. Their fears are well placed. OSINT information can be messy, incomplete, inaccurate, duplicative, unprecise, and inaccurate. Even worse, it can be purposefully misleading, either as part of a disinformation campaign or data poisoning attack.

The Janes OSINT COP solves these challenges by using Janes assured content at the heart of our data model. Our assured data is human-verified, using our world-leading analytic tradecraft. This assured content provides a baseline set of data that all other OSINT can be matched against. Since 2019, Janes has transformed our assured data into a complete data model, encompassing the entirety of the Janes data universe.

Using the assured Janes data model allows analysts to optimize content by enriching internal and third-party data against Janes. Using our human-machine systems, we are able to automatically match entities, yielding a complete, connected data set.