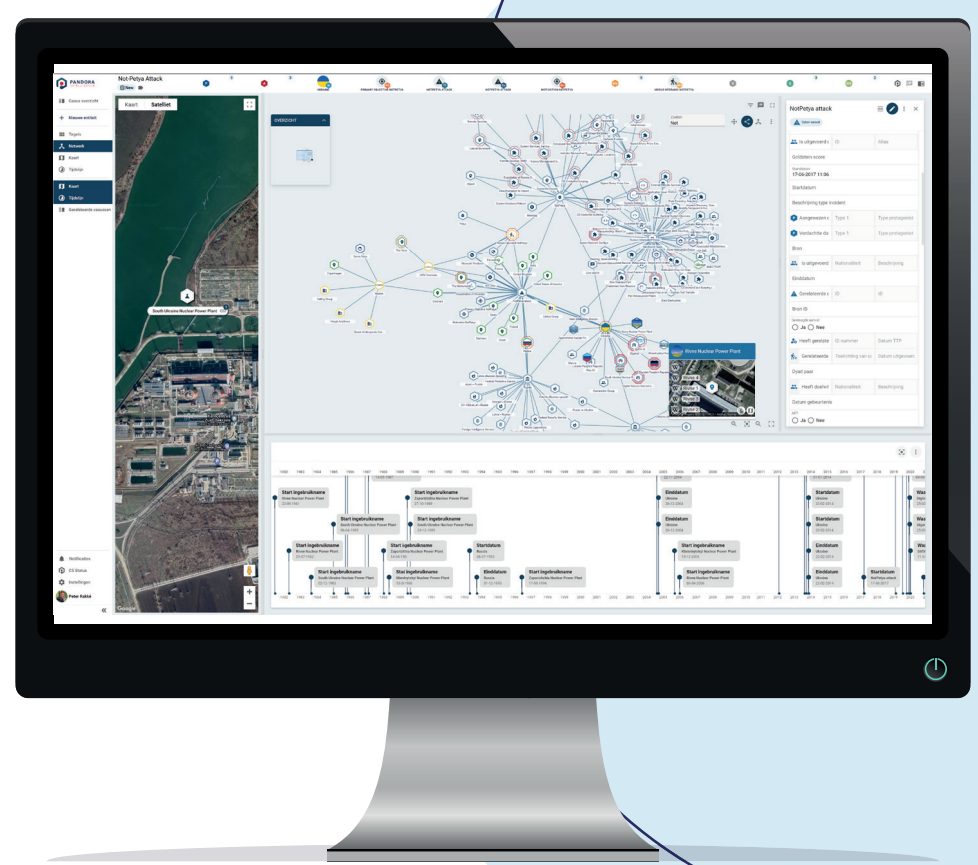




## Case Study Pandora Intelligence

# Visualizing data to make the world a safer place



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# Visualizing data to make the world a safer place

## How Pandora Intelligence uses graphs to boost security

Big Data is overabundant and increasing daily. But accessing huge amounts of data does not automatically produce clear insights. The challenge is analyzing the information effectively and efficiently. Mining data for complex, and often hidden, information is key for many companies seeking to improve public safety or simply increase their market share.

Pandora Intelligence specializes in analyzing large data volumes, using proprietary AI and deep-learning algorithms. The experts correlate actively acquired data, open-source data, and creative data such as films, books, and plays. Then the company uses this combined dataset to uncover the “narrative”. Ultimately, Pandora Intelligence offers clients specific intervention options to adjust the unfolding story and help change the course of events

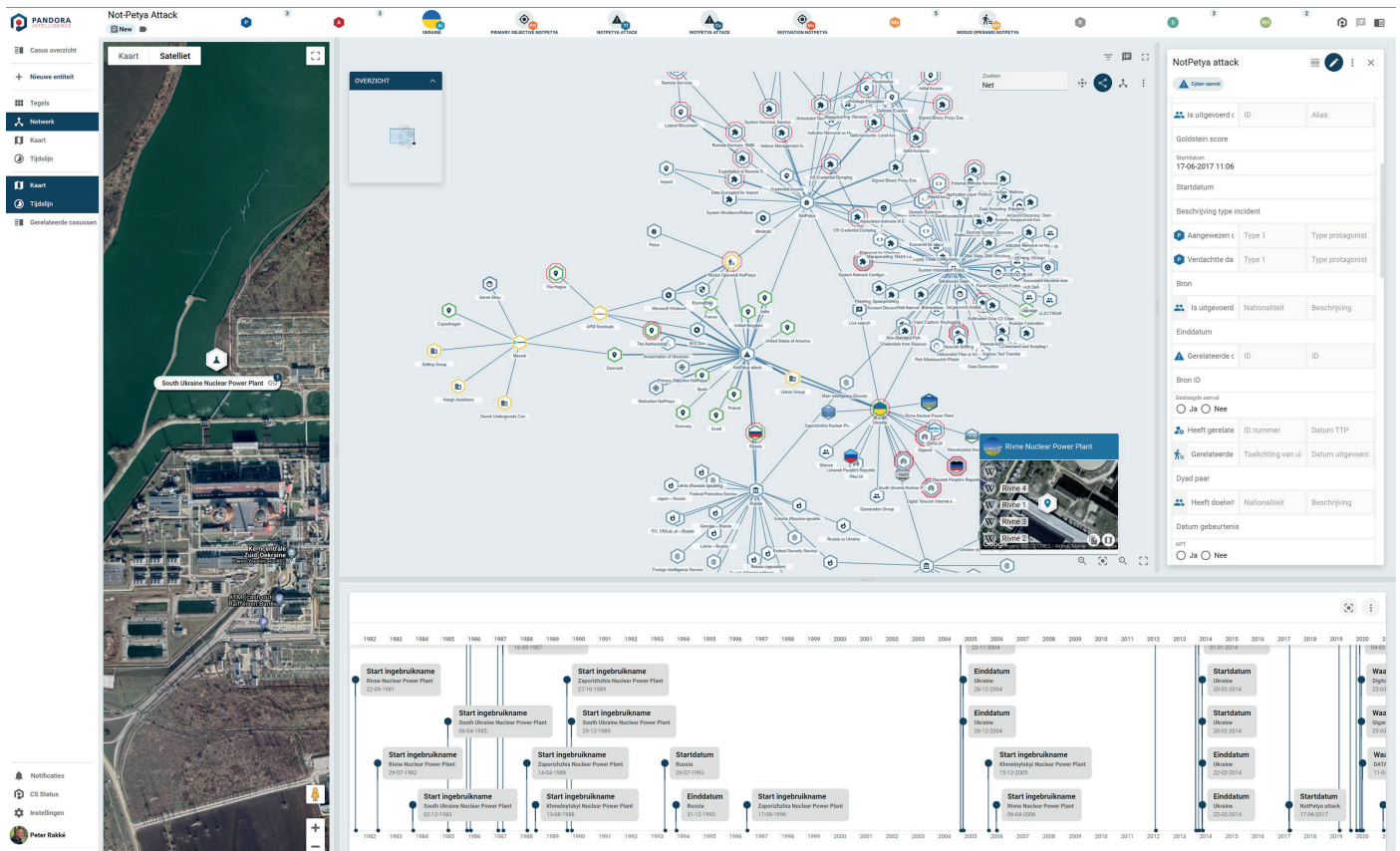


**Industry** Security and Investigation  
**Headquarters** Leusden, Netherlands  
**Headcount** +35

**Pandora Intelligence** is an independent intelligence company, specialized in security risks. Discover more at [pandoraintelligence.com](https://pandoraintelligence.com)

## Data mining and predictive analytics

Pandora Intelligence uses a patented, scenario-based model to capture the elements and relationships involved in any story. This enables the company to analyze, compare, correlate, dissect, and depict narratives — in past as well as emerging events. To further feed the scenario model, Pandora Intelligence actively helps its clients by acquiring information about adverse organizations and relating this information to the Pandora scenario model. To achieve this goal, the company has partners around the world and commissions highly-skilled operational teams.



CyberScenes overview of a cyber attack – and its context

## Needs & objectives

### Needs analysis

- Visualization of large data volumes
- Customized layouts and views
- High-end rendering
- TypeScript technology

### Objectives

- Simultaneously depict temporal, geospatial, and relational data
- Easily switch between (and combine) views
- Clear, appealing display in any layout

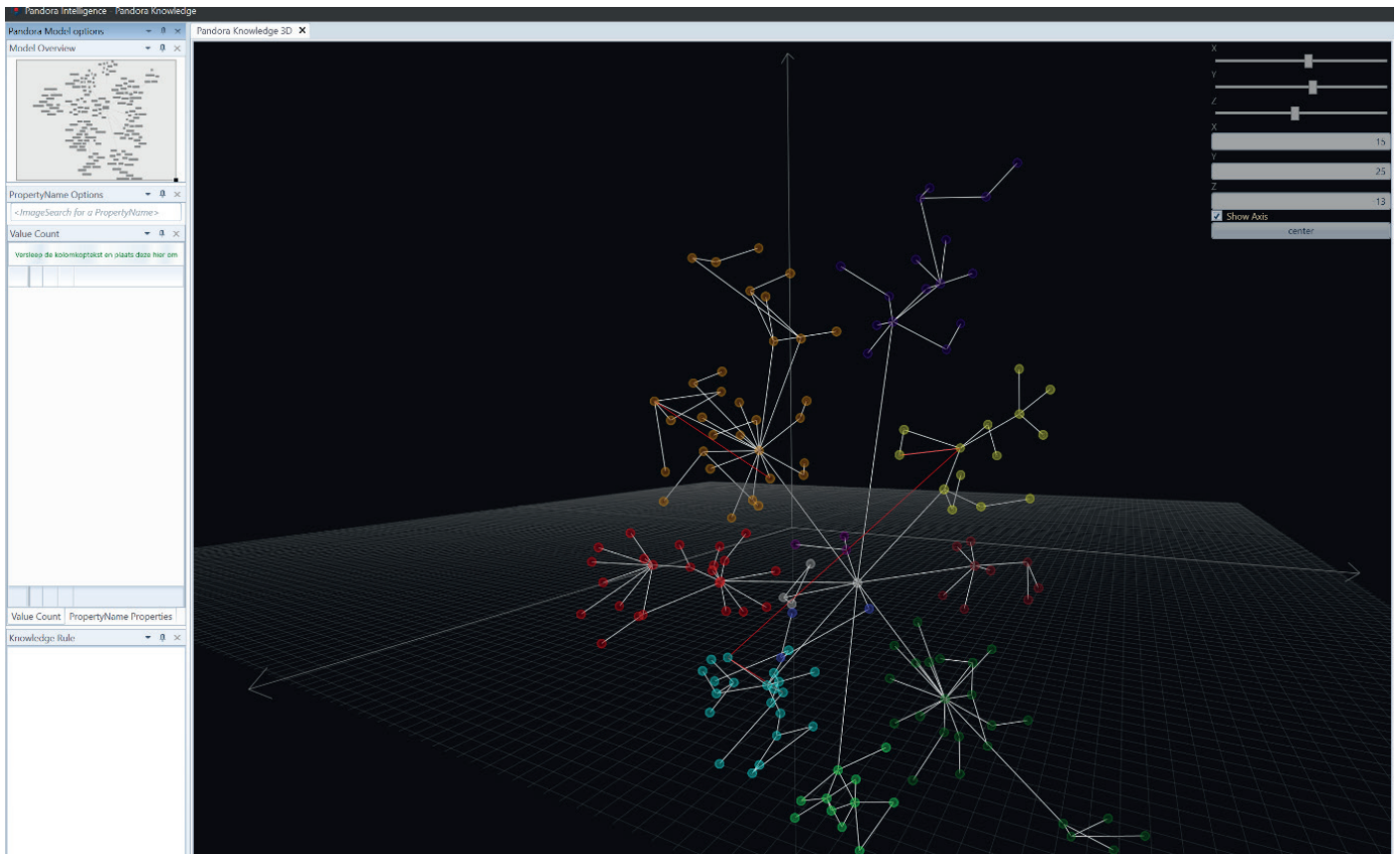
## A powerful engine under the hood

There is a dynamic layer within the application, no fixed data domain. Pandora Intelligence created an engine dependent on the ontology in the application. Story components (entity types) are identified automatically. Relationships are initially defined manually, then learned by the engine. Roles are another layer on top of the empirical information.

### Doctoral Thesis

What happens when an accomplished filmmaker starts looking at real-life crime through a story lens? If he's Peter de Kock, he writes his doctoral thesis on anticipating criminal behavior – and starts a cutting-edge company.





A small part of the ontology driving the Pandora platform

In the background — “under the hood” so to speak — this is all structured in graphs: with edges and nodes. One strength of the Pandora platform is that, if you have separate stories, you can calculate the distance between the stories, as Pandora Intelligence CTO Rakké explains. You can also automatically aggregate the stories — for example, in the case of human trafficking, combining 60 police reports to discover the “hidden logic” of criminal actions.

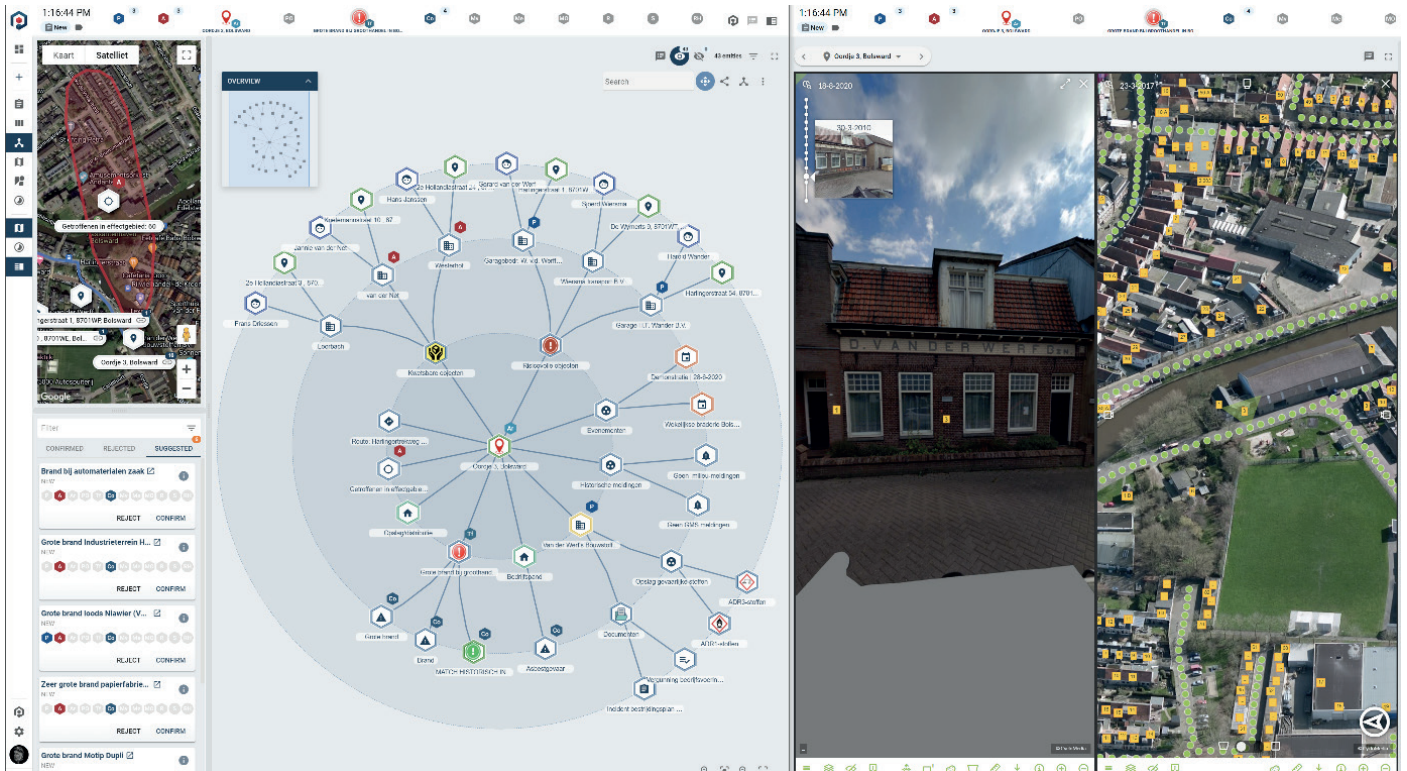
Another example: When Dutch emergency services receive a fire alarm, the dynamic Pandora engine automatically builds a complete picture of the event: from building contents (e.g. hazardous materials), incident type (e.g. electrical fire), weather (e.g. wind direction and speed). Previously, eight people needed to gather this information manually. Pandora only needs about a minute, and no supervision.

Pandora also lets you reason with data: visualizing

the affected area, how many people need to be evacuated, emergency capacities in nearby hospitals, and more. Pandora groups the “vulnerable objects” within the vicinity of the fire (childcare facilities, retirement homes, etc.). The engine even supplies lists of similar fires and how they were managed in the past. All automatically, and clearly structured in layers.



yFiles map integration demo



If a fire breaks out, crisis control organizations (fire, ambulance, police) can quickly achieve situational awareness

## Making connections, uncovering meaning

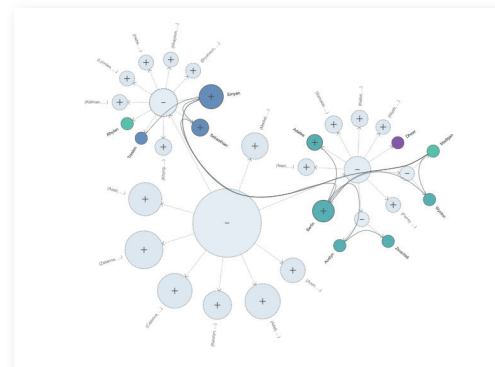
Pandora Intelligence founder Peter de Kock, now a professor at Tilburg University, has incredible talent for discovering the story elements within events. And CTO Peter Rakké is the technical mastermind who brings de Kock’s vision to life. Rakké explains:

*“We’ve been using yFiles since 2005. After looking at competitors, we decided to stick with yFiles. Its algorithms for layout are the best available. yFiles lets us simultaneously visualize geo data, time data, and the underlying connections.”*

— Peter Rakké, CTO, Pandora Intelligence

“Pandora Intelligence needs to present very complex information in a clear, understandable way. And yFiles from yWorks offers a fundamental component. This SDK makes it possible to simulta-

neously visualize geospatial, time, and connection data,” allowing users to grasp situations at a glance. “yFiles also can handle large graphs, adjusting styles and details to the zoom level,” he continues. “The SDK is very well-documented and the TypeScript demo was really helpful. The yFiles layout algorithms are the best available.”



yFiles large graph demos

## Stories that change the world

Despite initially focusing on crime and safety, the Pandora methodology, ontology, and platform are designed to be used in various areas. It's exciting to imagine a future where stories work to limit risk — and enhance opportunities — in fields like health-care, finance, and cybersecurity. yWorks is proud to provide support behind the scenes!

yFiles continues to impress:

Peter Rakké is excited to further improve their Pandora's software with yFiles' new WebGL2 support for hardware-accelerated graph rendering.



**yFiles** is available for **5** different **platforms** and **technologies**:

**HTML, JavaFX, Java** (Swing), **WinForms**, and **WPF**  
[yworks.com/yfiles/platforms](https://yworks.com/yfiles/platforms)

# There's more to explore!

## Getting started with yFiles

Learn more about **yFiles**, the diagramming SDK, and its **powerful** and **flexible features** for **HTML**, **Java**, **.NET**, and **WPF** here: [yworks.com/yfiles-overview](https://yworks.com/yfiles-overview)



## yFiles demos mentioned in this article

- Large graph demos
- Fraud detection
- Network monitoring
- Map integration
- Custom styles
- Level of detail



Direct access to all of our demos: [yworks.com/demos](https://yworks.com/demos)

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