

Micro Trends Analytics Facilitates and Leads to Rapid Monetization of Government IoT Projects

MICRO TRENDS ANALYTICS: APPLICATIONS IN GOVERNMENT IOT PROJECTS



Executive Summary

Each day government organizations face a virtual tsunami of data, which is difficult to manage, analyze and utilize. Emerging technologies, such as the Internet of Things (IoT) and trend analysis would make gathering and utilization of data easier. However, the government faces many challenges when it comes to adopting newer technologies.

These challenges include the perception of associated risks, lack of strategic planning and leadership obstacles, outdated and problematic procurement policies and more. Not only that, but the government also faces the lack of skilled personnel and leaders to effectively utilize these technologies. Implementation of newer technologies offer many benefits, but these challenges and others keep government organizations from considering the use of connected technologies.

This is where Trendalyze can help your government organization solve these problems. The platform has been built to operate like Google; rather than searching for words, Trendalyze searches for patterns within time series data from billions of trend lines. The service gives anyone the ability to pull these trends line to spot cost or inefficiency trends.

The benefits of using the Trendalyze platform include:

- **Improve efficiency:** in all government operations, at all levels by finding problems before they happen.
- **Increase citizen service:** search for micro trends that may be underutilized—trends that can provide your organization with improved service to the citizen.
- **Forecasting and monitoring:** get alerts for trend shifts to prevent problems before they occur and/or monetize real-time data, while also saving money.

The Virtual Tsunami of Big Data

Each day, government entities gather in enormous amounts of big data—it's a virtual tsunami of data, which can be overwhelming. This wealth of digital information is used every day to protect the country and citizens, while ensuring services run as necessary. Both the amount and complexity of this virtual data is overwhelming—making it challenge for the government to fully utilize the data and derive any benefits from the information it gathers. It's especially difficult for the government and its organization to spot micro trends within the virtual tsunami of data.

Connected Devices & Big Data

The government and its agencies are slow to adopt emerging technologies such as the Internet of Things (IoT). This is true even when the use of connected networks (devices and sensors) has the potential to quickly change the government's operating dynamics, leading to swift, measurable benefits at all levels.

Between the slow adoption of newer technologies and the enormous amounts of big data, the government faces several challenges in entering the market of IoT and data analytics. However, this is where Trendalyze can step in to help the government.

The Trendalyze Solution

Just as it does for the private sector, Trendalyze can work with government agencies to help them analyze the enormous amounts of big data they collect. The solution is the Trendalyze platform to find micro trends, specifically time series data which is collected at very regular intervals (minutes, seconds and even milliseconds), within big data that can lead to an overall increase in effectiveness and an increase in ROI.

What is Micro Trend Analysis?

Micro trend analysis is an analytical approach that puts the government and its agencies in contact with the information they need—when they need it. This type of analysis allows government organizations to gain insights from the data quickly and set alerts for the occurrence of micro trends in real-time, allowing agencies to make decisions to keep government processes on track and running smoothly.

In addition, micro trend analysis offers real-time management of issues before they become problems. Micro trends provide additional monetization opportunities that the government and its agencies would otherwise overlook. All of this can be done without the need for data scientists or custom application development.

Trendalyze has created an easy-to-use, innovative self-service platform

which gives organizations the ability to empower their officials and workers to make decisions and react to data trends as they happen—even up to the minute or second.

There's no need for the government to fall behind when it comes to data analysis. Trendalyze is a cost-effective, self-service platform that agencies can easily and quickly utilize, without the need of a data scientist.

Specific Government Uses for Trendalyze

Government implementation of IoT and micro trend analysis has the potential to work in many areas. Let's take a look at a few areas where these new technologies can aid government operations to run more effectively and efficiently.

Asset Management

One example of asset management is fleet telematics, which uses sensors to monitor and track the location and vehicle/driver performance within an organization's fleet. For instance, in 2015 the GSA (General Services Administration) began to utilize a telematic program to monitor its fleet of vehicles, which are used by many different government agencies. Telematics gives the GSA the ability to monitor several different micro trends in real-time:

- Location
- Vehicle navigation systems
- Emissions sensors

Benefits of Fleet Telematics

Monitoring these trends helps GSA to reduce the amount of greenhouse gas emissions, track the location of vehicles at all times, and monitor vehicle diagnostics (such as fuel consumption and maintenance problems). With the use of trend analysis, the GSA has been able to lower costs, increase overall fleet efficiency (including route planning), while protecting against workers' unauthorized use of vehicles and monitoring vehicles for maintenance problems in real-time (finding an issue before it becomes a major problem).

Challenges of Fleet Telematics

One of the greatest challenges for implementing fleet telematics is underutilization of telematics and the gathered data. This is a fairly new area of data for many government agencies and there tends to be lack of data use by decision-makers in the government. This could be due to the sheer amount of data and the complexity of the data presented to decision-makers.

Another issue is the mixed return on investment, with many organizations still not fully benefiting from the data provided by fleet telematics.

Again, this could be due to the large amount of data gathered, along with date complexity, making it difficult to spot those trends that increase ROI.

With Trendalyze, the government can extend the benefits they have already achieved by utilizing more of the data, spotting many more trends and offsetting the high cost of traditional implementations with the data scientist approach.

Automated Manual Processes

The IoT and trend analysis can be used for a multitude of purposes, including the automation of manual processes. For instance, the National Agriculture Statistics Services (NASS), an agency under the Dept. of Agriculture, has traditionally used thousands of workers to gather agricultural statistics from privately-owned farms in the U.S., which are used for production, marketing and distribution purposes. In recent years, NASS has implemented a system to gather this data from IoT technologies used in agriculture. These sensors aggregate data from everything including networked farm machinery to sensors that measure soil moisture.

The use of “smart farming” connected technologies helps government organizations to monitor certain agricultural trends such as changes in weather and level of crop harvest, to help farmers utilize water more efficiently, monitor and optimize the use of agricultural treatments (fertilizers, pesticides) and more.

The Benefits of Automated Processes

Automated processes and micro trend analysis include the ability to lower costs by using sensors, rather than workers, enables the government to help not only farmers, but those in many industries monitor for potential threats before they happen, helps to manage resources more effectively, and more.

Challenges of Automated Processes

When it comes to automated processes, the market is relatively new. The main challenges are development and use of IoT technologies—the choice and use of which types of sensors and devices, the need for analyzing large amounts of data and spotting those micro trends that lead to more effective practices and maintenance of the network, including the devices and sensors.

Once again, with Trendalyze the guesswork is taken out of the process because the government knowledge worker can use tools that, in the past, were reserved for the highly technical data scientist. The black box becomes demystified because now the business process worker can make sense of the data and the outcomes easily.

IoT & Improvement of Military Capabilities

IoT and micro trend analysis can also be used to help the government improve services for the military. Not only can these technologies be used to track resources and supply chains (including uniforms, vehicles and more), they can be utilized to increase all branches of the military's defense capabilities. Connected aircraft, for example, are already being used to gather all types of data to improve what is called situational awareness. This data is gathered, studied and shared with other branches of the military to gain a more accurate picture of a mission and/or battlefields.

The Benefits of Micro Trend Analysis & Improved Military Capabilities

The benefits of using IoT and trend analysis by the military are too numerous to list here. However, they do include the saving of lives (both civilians and soldiers), the efficient tracking and use of resources, and improved situational awareness and dissemination of this data to other military branches.

Government Challenges to Adapting IoT Technologies

While there many benefits to the government adopting IoT technologies and the use of micro trend analysis, there are a number of challenges that must be addressed. The government utilization of these technologies continues to be slow, which not only holds back development and use of these tools in the public sector, but also in the private sector. The reasons for this hesitancy to develop and utilize these helpful technologies include:

1). Perception of Associated Risks: government agencies tend to be conservative when it comes to taking advantage of emerging technologies. Newer technologies are often seen as untested and risky compared to technology that already exists and has proven stable. New technologies pose the risk of failure and may also fail when it comes to ROI. *This risk is minimized with self-service cloud-based technologies as they can be put in the hands of the business professionals to test and see the benefits themselves.*

2). Lack of strategic planning and leadership: many government agencies simply lack the leadership and vision when it comes to strategic planning and implementation of new technologies. Leaders in these agencies may be unaware of emerging tech, especially when it comes to the IoT. Not only this, but how to leverage these technologies within specific agencies also becomes a struggle. *This may be attributed largely to the difficulty of understanding new highly complex technologies. But who does not understand search?*

3). Lack of knowledge and skills: government IT workers may not have the technical skills necessary to adopt and utilize the Internet of Things

and trends analysis. In fact, there's a shortage of IT workers and data scientists. In addition, leaders in these agencies also lack the skills to effectively use the data provided by new connected networks. *This is why easier and more intuitive tools are needed. The Trendalyze self-service platform turns the business user into an advanced data scientists without any training.*

4). Antiquated and problematic procurement policies: just as government agencies tend to be conservative with adopting new technologies, they're constrained by outdated and burdensome procurement policies. This is the case especially when considering emerging technologies that are untested and considered "immature" in their development. *And yet a cloud based subscription model mitigates this risk entirely.*

5). Privacy and security concerns: the privacy and security of government and personal data is another issue that comes into play, especially with the IoT. The government carries a huge responsibility to keep its own and citizens' data secure and private at all times. Data-breaches by hackers are all too common in the private and public sectors, making this a real concern for government agencies, especially when considering the use of newer technologies. *However, cloud providers have added extra layers of security and cloud based solutions like Trendalyze leverage them effectively.*

6). ROI: return on investment is another major concern of the government with development and implementation of IoT technologies. The technology is new and not all aspects of its return on investment have yet been explored, which makes a risk-adverse government agency more tentative when it comes to adopting this technology. *And yet, businesses like Amazon have proven how gaining insights from big data about micro trends helps them gain enormous competitive advantage. Amazon pioneered the "long tail" retailing, i.e., promoting and driving the sales within micro segments.*

These and other reasons make it difficult for some government organizations to adapt technologies such as the Internet of Things and even micro trend analysis. One recommendation is already taking shape across government, that of collaborating with private sector technology partners such as Trendalyze, by placing technology from this sector in the innovation labs to identify and solve some of the government's more perplexing problems. In this way the government gets the benefit of the newest technologies but reduces their risk by testing the products in their labs against real government issues

Trendalyze Can Help Government Agencies with IoT & Data Analysis

Trendalyze has created a platform that's built to solve the challenges faced by government agencies when it comes to the Internet of Things and utilizing the enormous amounts of digital data gathered each day. The Trendalyze system is easy to use, providing instant results in

real-time to help increase ROI and overall efficiency for all types of government organizations.

The platform is built to operate like Google, but instead of searching for words, Trendalyze searches for patterns, sequences and motifs within time series data. Just as Google can find similar webpages within trillions of web pages, we can pull similar patterns from billions of trend lines. It's easy for government IT analysts and engineers to spot a costly or profitable trend. It's hard for them to find each and every occurrence of this trend. Trendalyze makes it easy for even non-IT and others to spot these trends.

Micro trend analysis is a tool used to manage and utilize large amounts of time series data that government agencies continue to gather. This type of analysis aims to discover sub segments in very large time series that exhibit interesting trends. Those trends typically reveal root causes of events the government wants and needs to manage. It is the Trendalyze unique visualizations and user experience that makes it easier to spot patterns (trends) in a time series as they occur—even right up to the minute or second. It is also Trendalyze's unique Google-like search allows government organizations and their personnel to quickly go from individual observations to grouping similar cases.

When applied in real time data streams, micro trend analysis gives an organization the ability to use micro trends to predict and even prevent problems before they arise or to make decisions that can save costs or drive new incremental revenues.

Not only that, but micro trend analysis gives the government information to better service public sectors, save tax payers' money, and better implement military strategies out in the field or on the home front. The Trendalyze platform is cloud-based, allowing you to instantly begin working with micro trends analytics. The platform is highly scalable and can ingest and manage volumes of times series and IoT data, all while using a Google-like search function to discover and manage micro trends across all government sectors. Finally, Trendalyze is a cost-effective platform that government agencies can easily and quickly utilize, without the need for data scientists and IT specialists.