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White Paper

Data Analysis

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Abstract

Data Analysis. The process of collecting, organizing and examining data sets in order to draw helpful conclusions about the “hidden / encrypted” information they contain.

Problem Statement

More and more businesses all over the world gain access to data and keep them without knowing what to do with them (how to collect them, store them, organize them & gain benefits from them). Structured data from business systems (keep them in spreadsheets). Unstructured data from documents, tweets, social networks and even photos, are the most valuable asset for an organization.

Data analysis is here to solve this problem with the aid of specialized systems and software. With the right software, all this data can be visualized, analyzed, and shared to connect with customers, transform business processes, and gather the real-time insights that will drive / lead to the right decisions making.

Data Analysis combine with Business Intelligence (BI) to gain benefits by visualizing and analyzing your data. Both areas can identify where businesses are failing or at the least not operating at peak efficiency, using the collected data to show where pain points are, giving organizations a better view of where they may be falling.

However, the real advantage using Data Analytics is the ability of prediction while in Business Intelligence deals only with the present. In simple terms, Data Analysis focuses on the future.

“DATA ANALYSIS IS HERE FOR THE FUTURE”

Background

NousPratIT, a software technology vendor that adds value to customers using the Mind (Nous in Greek) to make (Prato in GR) intelligent IT solutions, can empower people throughout your organization to ask any question of any data, in any environment, on any device. NousPratIT can help you to unlock insights from your data, and exploit those insights for competitive advantage. Read on to learn about the potential of NousPratIT for your business.

Solution

To lead in your market or industry, you must figure out how to extract business value from all your data and deliver it to the front lines. You must move analytics out of the back office and into the hands of operational workers. You must put your data in the context of the applications, activities, and devices that people use every day, so they can obtain timely insight to inform business decisions, automate workflow processes, and recommend the right course of action.

Data Scientists and Analysts use data analytics techniques in their research, and businesses also use it to inform their decisions. Data analysis can help companies better understand their customers, evaluate their ad campaigns, personalize content, create content strategies and develop products. Ultimately, businesses can use data analytics to boost business performance and improve their bottom line.

How it Works

Depending on what you ask for your business, data analysis comes with a variety of specific fields to give you specific answers. Before you start with the analysis you need to have procedures in place for managing the flow of data in and out of your systems and keeping your data organized. You also need to ensure that your data is high-quality and that you collect it in a central data management platform (DMP) where it is available for use when needed.

Establishing a data management program can help ensure that your organization is on the same page regarding how to organize and handle data.

There are several types of data analysis techniques that exist based on business and technology.

The major types of data analysis are:

- ***Descriptive Analysis***

Descriptive data analysis looks at past data and tells what happened. This is often used when tracking Key Performance Indicators (KPIs), revenue, sales leads, and more.

- ***Diagnostic Analysis***

Diagnostic data analysis aims to determine why something happened. Once your descriptive analysis shows that something negative or positive happened, diagnostic analysis can be done to figure out the reason. A business may see that leads increased in the month of October and use diagnostic analysis to determine which marketing efforts contributed the most.

- ***Predictive Analysis***

Predictive data analysis predicts what is likely to happen in the future. In this type of research, trends are derived from past data which are then used to form predictions about the future. Predictive analytics technology helps you analyze historical data to predict future outcomes and the likelihood of various outcomes occurring. These technologies typically use statistical algorithms and machine learning. More accurate predictions means businesses can make better decisions moving forward and position themselves to succeed. It allows them to anticipate their customers' needs and concerns, predict future trends and stay ahead of the competition.

- ***Prescriptive Analysis***

Prescriptive data analysis combines the information found from the previous 3 types of data analysis and forms a plan of action for the organization to face the issue or decision. This is where the data-driven choices are made.

- ***Text Analysis***

Also referred to as Data Mining. It is a method to discover a pattern in large data sets using databases or data mining tools. It used to transform raw data into business information. Business Intelligence tools are present in the market which is used to take strategic business decisions. Overall it offers a way to extract and examine data and deriving patterns and finally interpretation of the data.

Big Data is the Key / Core Role to the previous procedures is. Big data is a field that treats ways to analyze, systematically extract information from, or otherwise deal with data sets that are too large or complex to be dealt with by traditional data-processing application software. Data with many cases (rows) offer greater statistical power, while data with higher complexity (more attributes or columns) may lead to a higher false discovery rate. Big data challenges include capturing data, data storage, data analysis,
search, sharing, transfer, visualization, querying, updating, information privacy and data source. Big data was originally associated with three key concepts: volume, variety, and velocity. When we handle big data, we may not sample but simply observe and track what happens. Therefore, big data often includes data with sizes that exceed the capacity of traditional software to process within an acceptable time and value. (Wikipedia)

Important Reasons Why Big Data Is Used

- ***Time Saving***

Helps save time by providing instant insights using various resources.

- ***Big Data Better Analytics***

With introduction of real time analytics, Big Data is used in every field.

- ***Data Storage***

As it uses enormous amount of data, the storage methods are modernized.

- ***Insights Delivered On Time***

With help of structured data, better insights are delivered.

- ***Decision - Making***

Helps in taking better decisions after verifying and eliminating risks using risk analysis.

Data Analytics Tools

SQL

Structured Query Language is a domain-specific language used in programming and designed for managing data held in a relational database management system (RDBMS), or for stream processing in a relational data stream management system (RDSMS). It is particularly useful in handling structured data, i.e. data incorporating relations among entities and variables. (Wikipedia)

R / R studio Programming

R is the leading analytics tool in the industry and widely used for statistics and data modeling. R compiles and runs on a wide variety of platforms viz -UNIX, Windows and MacOS. It has 11,556 packages and allows you to browse the packages by categories. R also provides tools to automatically install all packages as per user requirement, which can also be well assembled with Big data.

Python

Python is an object-oriented scripting language which is easy to read, write, maintain and is a free open source tool. It was developed by Guido van Rossum in late 1980's which supports both functional and structured programming methods.

Phython is easy to learn as it is very similar to JavaScript, Ruby, and PHP. Also, Python has very good machine learning libraries viz. Scikitlearn, Theano, Tensorflow and Keras. Another important feature of Python is that it can be assembled on any platform like SQL server, a MongoDB database or JSON. Python can also handle text data very well.

IBM SPSS Modeler

IBM SPSS Modeler is a predictive big data analytics platform. It offers predictive models and delivers to individuals, groups, systems and the enterprise. It has a range of advanced algorithms and analysis techniques.

PowerBI

Power BI is a business analytics service by Microsoft. It aims to provide interactive visualizations and business intelligence capabilities with an interface simple enough for end users to create their own reports and dashboards. Power BI provides cloud-based BI (business intelligence) services, known as "Power BI Services", along with a desktop based interface, called "Power BI Desktop". It offers data warehouse capabilities including data preparation, data discovery and interactive dashboards. In March 2016, Microsoft released an additional service called Power BI Embedded on its Azure cloud platform. One main differentiator of the product is the ability to load custom visualizations. (Wikipedia)

Tableau Software

An American interactive data visualization software specialized in visualization techniques for exploring and analyzing relational databases and data cubes. Tableau products query relational databases, online analytical processing cubes, cloud databases, and spreadsheets to generate graph-type data visualizations. The products can also extract, store, and retrieve data from an in-memory data engine.

Excel

Excel is a basic, popular and widely used analytical tool almost in all industries. Excel becomes important when there is a requirement of analytics on the client's internal data. It analyzes the complex task that summarizes the data with a preview of pivot tables that helps in filtering the data as per client requirement. Excel has the advance business analytics option which helps in modelling capabilities which have prebuilt options like automatic relationship detection, a creation of DAX measures and time grouping.

Business Cases

Banking

One of the biggest uses of big data is in the field of banking. It enables banks to detect fraud and eliminate the loopholes in their systems. It helps banking sector in finding out any misuse of debit cards, credit cards and other services.

Other uses of Big Data in banking are in areas such as risk management, marketing, Performance analytics, Regulatory compliance, historical analysis and others. It is important to notice that big data analytics is playing a critical role in enhancing the overall performance of a banking system. There is enhanced compliance reporting, Personalized Product Offerings and other areas that are improved with the help of big data.

Transportation

From navigation system installed in automobiles to congestion management, Big Data is playing a big role in the field of transportation as well. It helps in the asset management by presenting opportunities, analyzing and reducing problems along with minimizing the costs of projects. It helps in collecting complex engineering data, storing it and ensuring that it is used for the enhancement of transportation industry. Big data helps in real time traffic management. Coordinate traffic signals are used for the purpose of reducing congestion – Big data helps in predicting the congestion even before its starts to happen. Big data utilizes algorithm, real time information and various historical trends to determine the congestion.

It also helps in the planning of transportation services. An example can be given of Uber, it uses big data to enhance its transport service.

Health Care

The importance of Big Data in the field of health care and medicine cannot be neglected. It helps in a way that it enables doctors, physicians etc. to keep a reliable track of their entire patient's history. For instance, if one of the patients visits a doctor, the doctor can easily obtain his patient's history. The information is only accessible to the doctor and the patient – it remains safe and secured. The data of any patient can be stored forever. The doctor can have access to the data anytime in the future.

The use of technology has enabled the field of health to prosper, and this means that a lot of technological devices that are deployed in this field are big data oriented. Today, doctors are able to prescribe medicines to their patients entirely on the basis of reports that they obtain through various tech devices. All the data obtained from tech devices are secured and stored with the help of Big Data.

In other cases, public health departments look at big data and analytics to prioritize food safety inspections of at-risk facilities. Researchers dig into data to reveal the places with the most significant disease patterns, too.

Moreover, big data and several kinds of analytics help hospital managers reduce waiting times and improve care. Some platforms look at data in bulk, then find the patterns within it and prescribe recommendations to produce progress.

Tourism

Data Analysis helps on gathering the information of public demand by analyzing the data travelers provide on social media. There are devices that can gather credit or debit card information for quick purchase and quick identification of the traveler.
In addition, airlines can plan effectively by the data of passengers and their luggage throughout the journey and provide services accordingly. Moreover, travel agencies can send offers and benefits suitable for a particular customer based on the information of Geo-location, traffic, and weather collected data. Finally, Big data can also help to provide security by using blockchain technology.

Ecommerce

Ecommerce is one of the legit ways through which people can earn online. Basically small to large businesses compete with each other in the eCommerce industry. Ecommerce not only enjoy the benefits of operating online but also faces many challenges to achieve the business objectives. Big data in eCommerce can provide competitive advantages by providing insights and analytical reports.

- Can collect data and customer requirements even before the official operation has started.
- Creates a high performing marketing model and set a startup apart from the existing and become successful.
- Ecommerce owners can identify the most viewed products and the pages that appeared the maximum number of time.
- Evaluates customers behavior and suggests similar products. It increases the number of sales and generates revenue.
- If any product is added to cart but was not ultimately bought by a customer, big data can automatically send a promotional offer to that particular customer.
- Big data applications can generate a sorted report depending on the visitor's age, gender, location, and so on.

Digital Marketing

Marketing trends for the business have completely changed. Digital marketing is the key to make any business successful. Now, not only the big companies can run marketing promotional activities but also the small entrepreneurs can run successful advertising campaigns on social media platforms and promote their products. Big data has made digital marketing really powerful, and it has become an essential part of any business.

- Analyzes market, competitors and evaluate the business goal. It can identify the opportunities as well.

- Can find the existing social media users and target them based on demographics, gender, income, age, and interests.
- Generates reports after every ad campaign that includes the performance, audience engagements, and what could be done for generating better results also.
- Data science used for possible retargeting customers and transform into loyal clients.
- Focuses on highly searched topics and advice the business owners to execute them on content strategy to rank business's website higher on google.
- Can create lookalike audiences using the existing audience database to target similar clients and earn the profits.

Retail

If retailers do not correctly anticipate what customers want and then provide those things, their establishments will likely falter. Big data and analytics provide the insights needed to keep people happy and returning to stores. A study from IBM found 62 percent of respondents in retail said information and analytics gave them competitive advantages.

The most useful strategies involve identifying business needs first, then figuring out how analytics technologies support those requirements. For example, a retailer might want to keep shoppers in physical stores for longer periods of time. Then, it could use big data and analytics to create personalized, highly relevant material that excites and engages in-store visitors. Analytics software can track every step of a customer's journey, too. The resultant insights could tell retailers how to attract the most high-value shoppers. Examining weather data could predict an increased need for seasonal items like snow shovels and beach chairs, too, letting retailers order those things before most customers arrive.

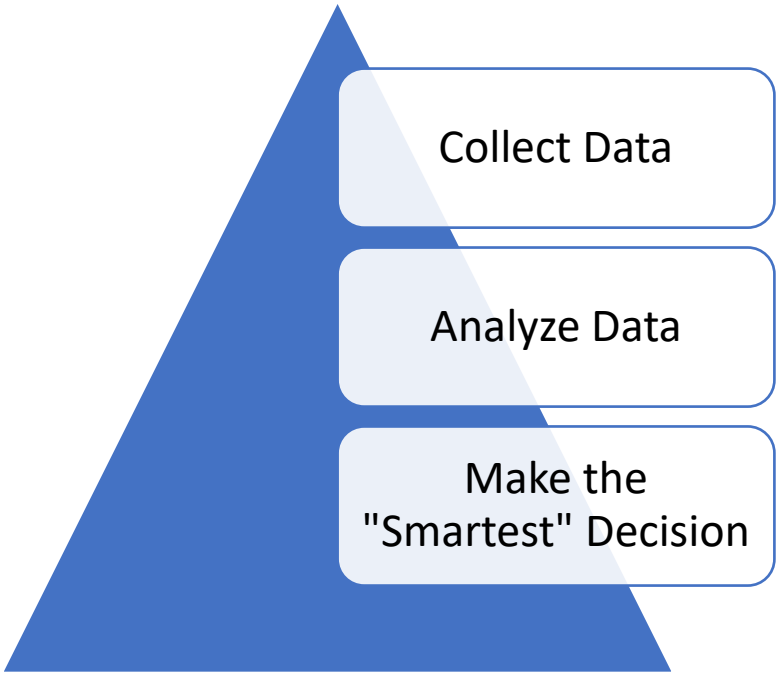
A deeper view in two Business Cases

Data Analysis in Agriculture – Cannabis business case

Introduction

In agriculture, Data Analysis can play an influential role in order to enhance the performance of your firm. Data handling is the core key to success, from the data collection from your fields to advanced predictive / forecasting models for the market. Wherever your data is stored and whatever types they are from weather conditions data and field watering system data to retail, delivery and compliance to the nation law types of data, advanced algorithms will give you the boost for fantastic decision making in every aspect of your firm.
How modern technology of IoT, big data, analytics, and cloud computing can help you boost your company:

- IoT devices help in the first phase of this process — data collection. Sensors plugged in tractors and trucks as well as in fields, soil, and plants aid in the collection of real-time data directly from the ground.
- Second, analysts integrate the large amounts of data collected with other information available in the cloud, such as weather data and pricing models to determine patterns.
- Finally, these patterns and insights assist in controlling the problem. They help to pinpoint existing issues, like operational inefficiencies and problems with soil quality, and formulate predictive algorithms that can alert even before a problem occurs.



Heavily Regulated Cannabis project

Seed-to-sale cannabis platform

(At this point we have to make a short brief about our platform)

https://www.nugistics.io/seed-to-sale-software/

By using our Nouspratit platform for your firm you will be able to collect a variety of data regarding the whole process of your company's activity.

Internet of Things (IoT):
implementing connected devices and innovative technologies together into "agriculture" in the domain of Cultivation & Manufacturing for the "cannabis final product"
"IoT based Smart Farming improves the entire Agriculture system by monitoring the field in real-time. With the help of sensors and interconnectivity, the Internet of Things in Agriculture has not only saved the time of the farmers but has also reduced the extravagant use of resources such as Water and Electricity. It keeps various factors like humidity, temperature, soil etc. under check and gives a crystal clear real-time observation."

Sensors in your field will collect data.
Analyze them to achieve:

- improve farm yields, by helping on make smart decisions such as when to harvest, what is the appropriate usage of the watering system etc
- save money, by reducing costs for resources (water, electricity and human), by automating actions (suggestions depending on the conditions)
- draw your plan to decrease costs & increase yield, the use of sensors in every step of the farming process like how much time and resources a seed takes to become a fully-grown vegetable
- using pesticides ethically, by recommending what pesticides to apply, when, and by how much. By monitoring it closely, farmers can adhere to government regulations and avoid overuse of chemicals in food production. Moreover, this leads to increased profitability because crops don't get destroyed by weeds and insects
- can analyze data from the past years and suggest solutions that work in your field
- predictive algorithms that can alert even before a problem occurs

Sensors in your laboratory will collect data.
Analyze them to achieve:

- meet your product's standard
- check product's compliance (law etc)
- visualize your product line for quality control (in real time)
- can alert you in case of a problem occurrence

Collect and store data from your CRM-ERP platforms to achieve:

- analyze historical data for each customer (behaviour etc)
- analyze economics data from sales and purchases
- track & trace in inventory, Warehouse management
- monitoring global sales and gain advantage

Get ahead with an innovative technology and leave behind you the old-fashioned spreadsheets.
Plain old spreadsheets might have worked fine for the business when you were just starting out. But if you're still using simplistic record keeping tactics in today's ultra-competitive market, you're just leaving money on the table. See how spreadsheets stack up against cannabis ERP software that was built to support the modern cannabis business and take the most out of analyzing your stored valuable data.

Spreadsheets	Integrated Cannabis ERP Software
Blank fields you set up yourself	Custom-configured workflows to match your operations
Time-consuming data entry	Data is updated in real time
Double data entry	A single change updates all related records automatically
Complicated equation programming	Straightforward prompts let you analyze data fast
Information silos in disparate computers	Secure, 24/7 cloud-based access to all your data in one place
Compliance reporting struggles	Automatic reporting that complies with local regulations
Multiple sheets for multiple dispensaries or locations	View data for all your locations in one place, even those in different states or countries

Data Analysis in Construction Industry

Introduction

Construction companies track everything from materials-based expenses to the average time needed to complete tasks. It is not much of a surprise then, that data analytics is becoming a big part of the industry.

When construction professionals monitor field service metrics such as attrition, the lifetime values of customers, referral rates and revenue, they will be better able to see what is going well and which parts of the business need improvement. Moreover, big data analyzes the best place for a project based on anticipated future uses and trends. Some projects even incorporate sensors into buildings and bridges, and those accessories collect data and send it back to people for analysis.

In its most widely used context, construction:

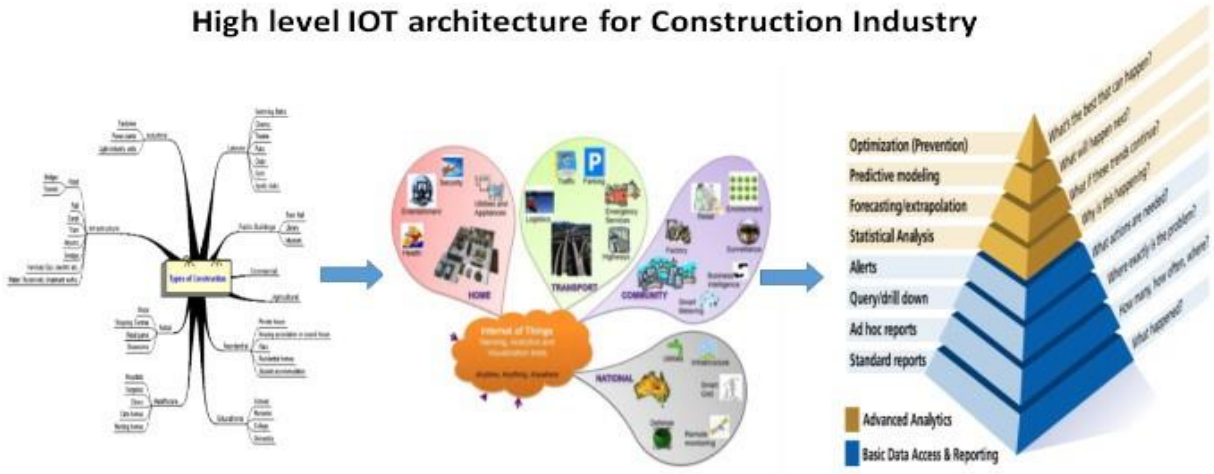
- covers the processes involved in delivering buildings, infrastructure and industrial facilities, and associated activities through to the end of their life. It typically starts with planning, financing, and design, and continues until the asset is built and ready for use.
- also covers repairs and maintenance work, any works to expand, extend and improve the asset and its eventual demolition, dismantling or decommissioning.

The Value of Data

The construction industry has always been a victim of poor planning, management, budgeting, miscalculations, cost overruns, low return on construction assets, mistakes in proportions, and insufficient means for the building. Data science is called upon to make these problems miserable and facilitate construction on each of its levels. The construction companies use the benefit of data science to improve construction sites and manage the building process.

Traditional information systems are good at recording basic information about project schedules, CAD designs, costs, invoices, and employee details. However, they are limited in their ability to work with unstructured data like free text, printed information or analog sensor readings. Often, they can only handle orderly digital rows and columns of numbers.

The idea of harnessing big data is to gain more insights and make better decisions in construction management by not only accessing significantly more data but by properly analyzing it to draw practical building project conclusions. In fact, big data, like truckloads of bricks or bags of cement, is not useful on its own. It is what you do with it using big data analytics programs that count.



Construction Industry handling Big Data

To see how big data is already being used by the construction industry, consider the design-build-operate lifecycle that increasingly defines construction projects today:

Design

Big data, including building design and modeling itself, environmental data, stakeholder input, and social media discussions, can be used to determine not only what to build, but also where to build it.

Brown University in Rhode Island, US, used big data analysis to decide where to build its new engineering facility for optimal student and university benefit.

Historical big data can be analyzed to pick out patterns and probabilities of construction risks to steer new projects towards success and away from pitfalls.

Build

Big data from weather, traffic, and community and business activity can be analyzed to determine optimal phasing of construction activities.

Sensor input from machines used on sites to show active and idle time can be processed to draw conclusions about the best mix of buying and leasing such equipment, and how to use fuel most efficiently to lower costs and ecological impact.

Geolocation of equipment also allows logistics to be improved, spare parts to be made available when needed, and downtime to be avoided.

Operate

Big data from sensors built into buildings, bridges and any other construction makes it possible to monitor each one at many levels of performance.

Energy conservation in malls, office blocks and other buildings can be tracked to ensure it conforms to design goals.

Traffic stress information and levels of flexing in bridges can be recorded to detect any out of bounds events.

This data can also be fed back into building information modeling (BIM) systems to schedule maintenance activities as required.

Big data analytics can enable or offer opportunities to improve each of these aspects. The variety of inputs in big data allows better levels of certainty about status reports and forecasts. The analytics can provide more helpful indications of risk levels before a threshold is exceeded and an alert generated. They also offer insights that traditional systems simply cannot.

How Drones Are Being Used in Construction

The presence of drones in construction means significant changes within the industry. Drones have already begun changing the way the construction industry operates, and those changes will have continued and lasting effects. Here is a look at some of the ways drones have already changed the industry and how these trends will impact construction operations in the future.

Surveying Land

Unmanned Aerial Vehicles (UAVs) are rapidly replacing traditional land-surveillance methods. They are growing in popularity so rapidly that some have even abandoned the classic “bird's-eye view” expression with “drones eye view.” Drones greatly reduce the labor and time involved in producing accurate surveys. Drones eliminate much of the human error involved in the process and have the ability to capture necessary data in much less time than traditional methods would take.

Improvements to Infrastructure

Drones provide superior endurance and intelligence on job sites. Their ability to collect and report data allows them to complete work faster. The need for manual labor is all but removed from the equation. In the future, drones will take on even more integral tasks involved in large projects. They are poised to cut the time it takes to build a skyscraper by a broad margin, thereby cutting costs. Contractors who rely on drones will be able to make much more ambitious bids and complete work on time.

Communication and Management

Drone technology has evolved to the point where instant connectivity and communication on the job site are at a surplus. Drones are being used more and more as a means of maintaining constant contact at worksites. Drones that feature mounted cameras can provide video footage to facilitate communication and surveillance. They allow companies to keep tabs on employees

and workers and are considered an increasingly invaluable tool for superintendents and investors.

Already, communication and management are seeing a sharp increase in efficiency due to the ability to collect real-time data from drones. The decrease in delays in gathering data is having more of an impact each day. The ability to manage workflow 24/7 is unprecedented and is certain to have a significant impact on all manner of construction processes.

Improved Overall Security

The advent of drones is causing a sharp increase in security efficiency. Whether the drones are used to maintain the safety of employees or to protect the job site from theft or vandalism, they are steadily seeing greater implementation in the construction industry.

Accurate Surveillance

Drones have the ability to be practically everywhere at the same time. They don't just reduce theft and keep workers safer; they create an around-the-clock, real-time monitoring system that has already been adopted by a number of construction companies. They elevate onsite security and safety by a tremendous margin.

Even though the FAA exacts strict standards on the use of drones, most models used by construction companies come in under the 4.4-pound weight threshold and 400-foot travel radius required to be considered hobby class, as reported by The Washington Post. Drones that meet those criteria are not subject to stringent regulations. As of right now, they can be flown practically anywhere for any reason. Drones can also safely survey dangerous locations, reducing workplace accidents and increasing job site safety.

Transportation and Inspection

The use of drones in job site inspection also means a drastic increase in worksite safety by eliminating numerous dangers and safety hazards. Using drones to transport goods aerially allows companies to execute difficult inspections and keep track of everything that enters and leaves the job site. It saves money and time and keeps the site secure.

Since drones are generally small with high levels of maneuverability, they are being used more and more as an alternative to traditional vehicles. Even better, drones do not have to adhere to traffic laws, which allows them to make deliveries in a fraction of the time, using half of the resources.

The construction industry is evolving at a rapid rate, and with all the innovations and changes to traditional methods comes the need for greater efficiency in every aspect of your business. As you consider ways to increase the efficiency of workflow, we recommend perusing Capterra's growing library of construction management software that will help increase productivity and efficiency in your construction business.

IBM – Case Study – Drone Deploy:
https://www.ibm.com/case-studies/c848309d42496w67

For more information

To learn more about NousPratIT Data Analytics Solutions, please contact your NousPratIT representative or NousPratIT Business Partner, or visit: https://nouspratit.gr/el/

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