PECB Insights

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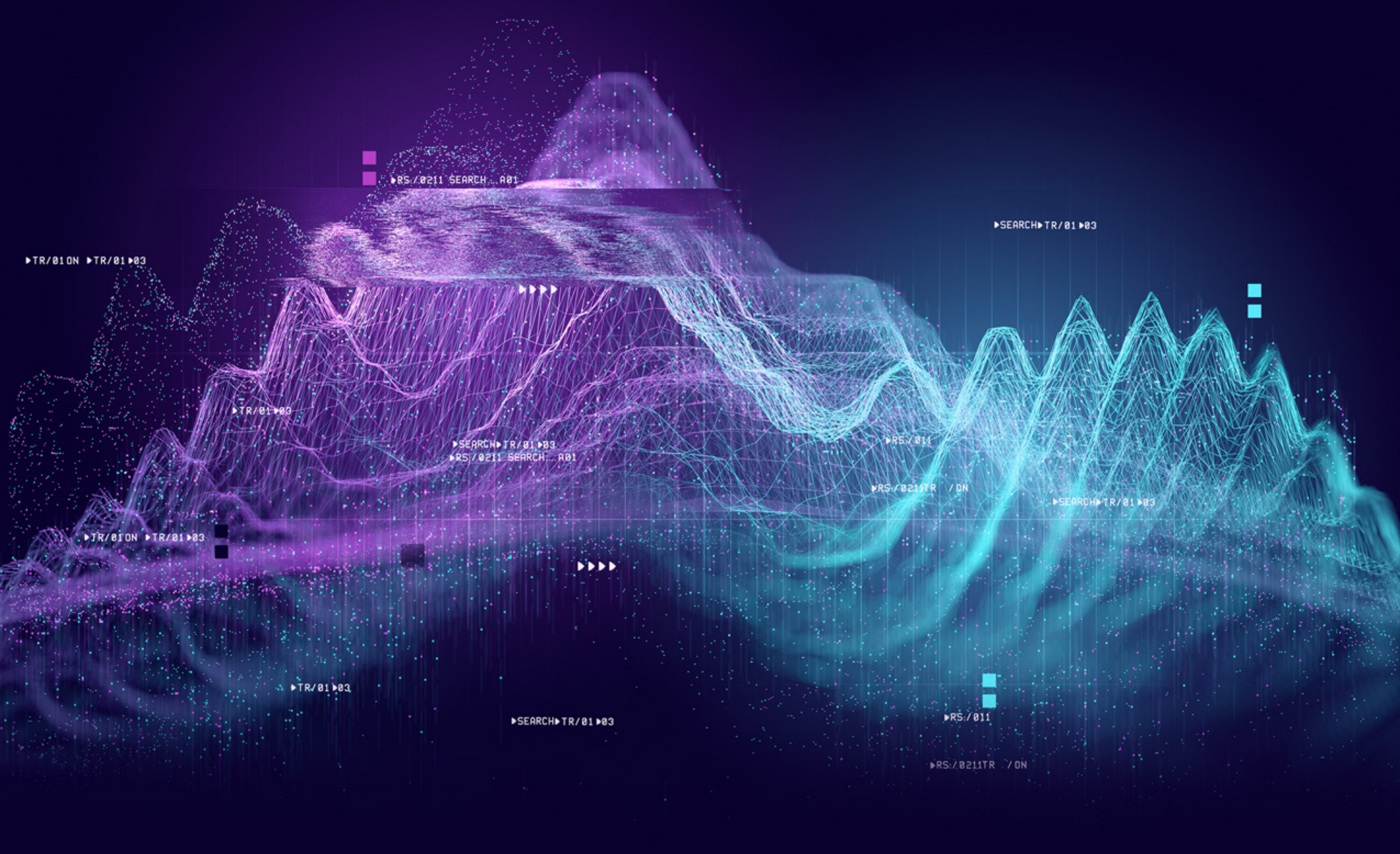
BIG DATA ANALYTICS

THE IMPACT, THE COMPONENTS, AND THE PERSPECTIVE



LEADERSHIP STANDARDS EXPERTISE TECHNOLOGY BUSINESS & LEISURE TRAVEL SUCCESS STORY OPINION BOOKS INNOVATION

In This Issue

"Data is the new science. Big Data holds the answers."

PAT GELSINGER
CEO of Intel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Enabling an AI-Ready Culture

Artificial intelligence holds the potential to deliver enormous benefits to society, and a management system standard might be the answer everyone is looking for.

Artificial intelligence (AI) promises organizations to be 40% more efficient by 2035, unlocking an estimated USD 14 trillion in new economic value to global GDP by 2030, according to PwC. This makes it the biggest commercial opportunity in today's fast-changing business climate, all while improving billions of lives.

To unlock the full potential of AI, however, leaders must think differently. "We cannot ignore that we have to apply global standards to get the maximum benefit based on responsible use of AI technology," says Microsoft's Jason Matusow. These standards, he adds, would need to address business-to-consumer, as well as business-to-business (B2B) scenarios to be of value.

As General Manager of Microsoft's Corporate Standards Group, Matusow believes the production and adoption of AI International Standards will enable efficient, effective, and trusted solutions that strengthen consumer, B2B, and regulator confidence. "AI will augment human capability," he explains, "opening the door to enormous new opportunities for every industry. It will empower individuals to achieve more in their daily lives."

Everything digital

Digital transformation has taken root on a global scale. And things are only going to get more digitized as the world embraces the ability to convert data. A new report from the World Economic Forum (WEF) states that, by 2022, 60% of the global GDP will be digital. In three short years, it observes, there will be "very little distinction between the digital economy and the economy, or between digital society and society".

AI is running in the background of our daily lives continuously. Anything from creating new business models for jet engines and financial services to improving the traffic flow in smart cities is leveraging the opportunities of this digital transformation. Its benefit to society and individuals is so vast and immense that it cannot be reduced to figures alone.

Nonetheless, as the transformative potential of AI becomes clear, so, too, have the risks posed by unsafe or unethical practices of such technologies.

Cybersecurity, privacy, and data governance are all part of the responsible AI story. This was highlighted in the Davos Agenda organized by the WEF to foster responsible AI leadership. The platform sheds light on how the world is trying to tackle these issues while emphasizing that a lack of global consensus is holding back the accelerated adoption of the technology and the benefits it could bring.

Building trust

For many AI experts, creating an agency of trust will expand opportunities for every sector. The key is to start with "responsible" AI standardization. At the heart of this work is subcommittee SC 42, Artificial intelligence, whose ideal

outcome is to create an ethical AI-enabled society. Working under ISO/IEC JT 1, the information technology arm of ISO, and the International Electrotechnical Commission (IEC), the expert group on AI is making headway on a ground-breaking standard that, if accepted, will offer the world a new blueprint to facilitate an AI-ready culture. This management system approach will establish specific controls, audit schemes, and guidance that are consistent with emerging laws, regulations, and stakeholder needs.

However, a lot still needs to be done. According to New York University's AI Now Institute, based on the current AI adoption rates, only North America, Europe, and China will capture roughly 80% of the economic benefits brought by AI, leaving just 20% for the remaining two-thirds of the global population. If this trend continues, there will be a huge missed opportunity to significantly enhance the lives of billions of people and improve the state of the world.

The impact of AI will always be measured in human terms.

The time is now

There has never been a more relevant time for international standards development in the field of AI. Traditionally, AI had focused on large-scale problems that were either too hard or complex to solve with traditional methods. This is no longer the case. As the need for AI-based systems has grown exponentially over the years, cutting-edge technology is finding more mundane applications. But the barriers for its broad adoption, combined with a strong demand for global consensus, have now made the ecosystem ripe for standardization.

Wael William Diab, Chair of SC 42, believes standards can enable an AI-ready culture and fuel the digital transformation. "While there is no single silver bullet to unlocking the potential of AI and enabling the promise of digital transformation, the importance of standardization cannot be overstated," he says. The holistic approach will look at the entire AI ecosystem, as Wael explains. "Having a management system standard is an important part of that strategy, which is ultimately aimed towards to continual improvement of a system."

ISO and IEC strive to dynamically react to emerging industry needs. Together, the two organizations are leveraging an ecosystem approach to accelerate AI adoption whilst simultaneously addressing fairness, accountability, and ethical concerns.

> **AI is running in the background of our daily lives continuously.**

A Management System approach

Collaboration is central to making sure standards reflect how organizations are using AI and balancing the risks with commercial reality. "ISO and IEC offer multilateral collaborations which can help us maximize the benefits of AI. By removing barriers to technology adoption, standards simultaneously and proactively ensure that societal concerns are addressed," says Diab. " The diversity of stakeholders in SC 42 can ensure better standards and, ultimately, broader adoption."

So a fit-for-purpose approach is the answer. In fact, as Wael suggests, "it is key to solving one of the most pressing governance issues of the 21st century". Standards can play a constructive role in fostering the widespread use of responsible AI. For example, a management system standard (MSS) can establish common building blocks, and risk management frameworks, for companies, governments, and other organizations.

With an MSS approach, the implementation of AI technologies will:

- Enable organizations to dynamically map their work to the regulatory and societal requirements captured through the MSS
- Be a trust mechanism that will facilitate B2B contracting
- Establish a baseline that can be verified through audit and/or conformity assessment

As Wael explains, the SC 42 ecosystem approach, of which the MSS is a key part, ensures that stakeholders of many different backgrounds can establish a framework. A framework that, according to the world-renowned AI expert, enables organizations to speak the language necessary to implement and reap AI's full potential. "Novel standards like the management system standard go a step further to addressing issues of confidence and pulling all the work together."

Managing uncertainties

With AI's impact on industry and society accelerating every day, and all the uncertainties around how it is being managed, it is imperative that we ensure the technology is used ethically for the sake of global public interest.

Microsoft's Jason Matusow agrees: "As a platform provider, success for us is when the economic benefit to our customers collectively dwarfs the economic benefit to our business.

The work of SC 42 will be an important enabler for marketplace expansion in which every organization can participate and benefit." In fact, all organizations will reap rewards if the AI standards follow the same consistent, risk-based approach already in practice for cybersecurity and privacy.

The impact of AI will always be measured in human terms, in the enhancement of people's lives, and ISO and IEC will continue to create a set of standards that support the full spectrum of global interest.

As the technology works itself into almost every aspect of our lives, AI will need protecting against negative uses, both deliberate and unintended, for the sake of individual rights, human safety, and societal welfare.

The opportunity, and challenge, is to use the standards process effectively to promote, develop and realize the promise of responsible AI, delivering business growth, improving services and protecting consumers.

The work of SC 42 is an important thread in the global tapestry needed to build a safer, interconnected future that we can all look forward to.

Using the Power of Relationship between Big Data, IoT and Cloud

BY KEVIN DERMAN

The value Is in the system

Technologies rarely exist within a vacuum. We typically invent and build new technologies by using existing ones. IoT, big data, and the cloud are no exception to this rule. To illustrate this, let us examine the human body.

The human body is an amazing organism; a system of interconnected specialist parts. We have many different input devices. Our eyes and ears constantly feed data into our brain on what the world looks and sounds like. Our hands function both as input and output devices. Sensing objects as we hold them, identifying, protecting, and reacting to the information and meaning given from the brain, and then being able to output this as movement.

Typing this article is a great example. My hands on their own could not fulfil this function. They need instruction from my brain. This instruction is based on data that has been collected by my brain over many years. This data was consumed in the form of images, text, lectures, and personal practical experience, and is now stored somewhere in my brain.

When a person encounters new data, the information makes it's way to the brain where it is combined with pervious knowledge to give it meaning. One can then decide on a course of action based on the initial data. The ability to give meaning to data based on past experience is commonly known as knowledge (see Diagram 1). We therefore have a very natural process of turning data into knowledge and ultimately into action.

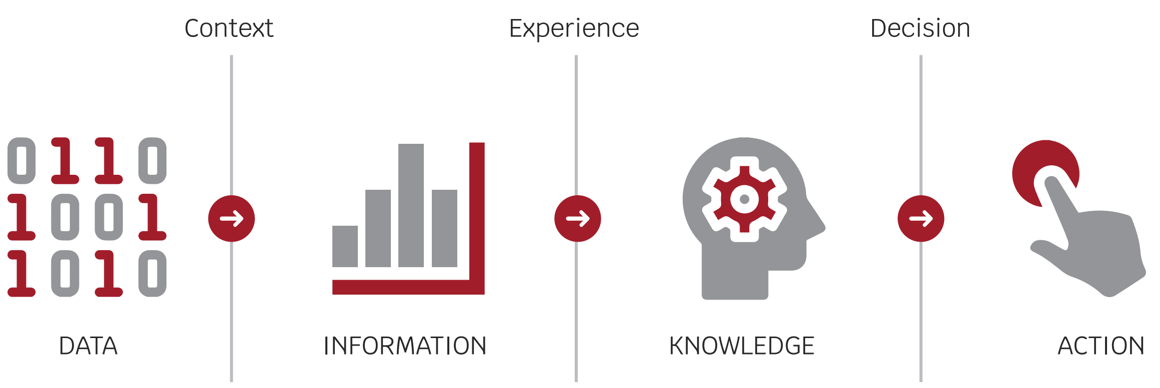

Diagram 1. *The transition from data to knowledge to action*

The relationship between big data, IoT (Internet of Things), and the cloud is almost identical to the previous example. Data only fulfils its purpose when it is analyzed and contextualized, thus becoming information. Add experience to information and you get practical knowledge.

IoT devices collect data from their sources at the edge, this could represent movement, temperature, geolocation, time points, etc. The data then needs to go through storage and processing in order to get contextualized.

There are several criteria that can be used to classify data, including origin and date of creation. Such classifications can then be used to compare one set of data with another one of the same criterion.

This is typically a machine learning process, where a prediction can be made based on a previously created model on one or several metrics obtained. The output of the findings may be to create an action on the device, like shutting the appliance down (see Diagram 2).

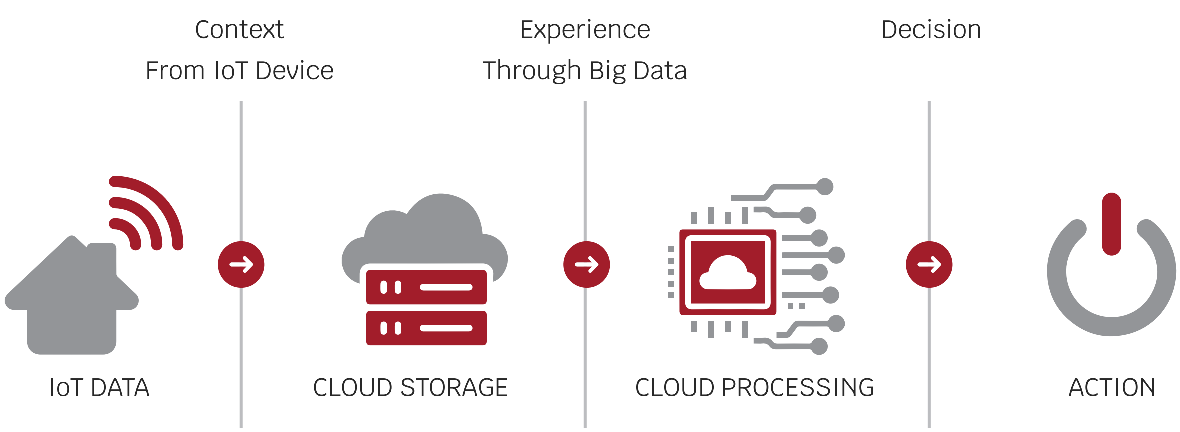

Diagram 2. *IoT, big data, and the cloud*

The following elements have the potential to create bottlenecks for an efficient flow of the process illustrated above.

- Internet connectivity
- Data storage
- Processing speed
- Actionability

The priority of these factors depends on circumstances. If, for example, we have to shut down a piece of machinery before it injures someone, then the connectivity and processing speeds are critical. For this reason, many IoT devices perform their own processing at the edge in order to perform immediate automated actions. Even in these cases, the models are generally created, analyzed, and updated in the cloud and then exported back to the IoT device, where decisions and actions happen.

In Diagram 3, we have a typical use case of an IoT device monitoring machines to predict potential failures and shutdown. In this example, data is collected from the IoT device and transported to the cloud, which has a machine learning model to predict failure. This model is deployed to an IoT Edge device which monitors and, when needed, makes an action.

In this case, the processing of any additional incoming data will be performed at the edge. Latency is dramatically lower than in cloud processing. In addition to this, failure data is constantly uploaded back to the cloud to be combined with the older data and any additional big data available. The machine learning model is then further trained and updated with the new data. Should the model change significantly, it can then be pushed through and updated on the IoT Edge device. The cloud and big data are necessary for these processes, regardless of the ability to process data in the IoT edge.

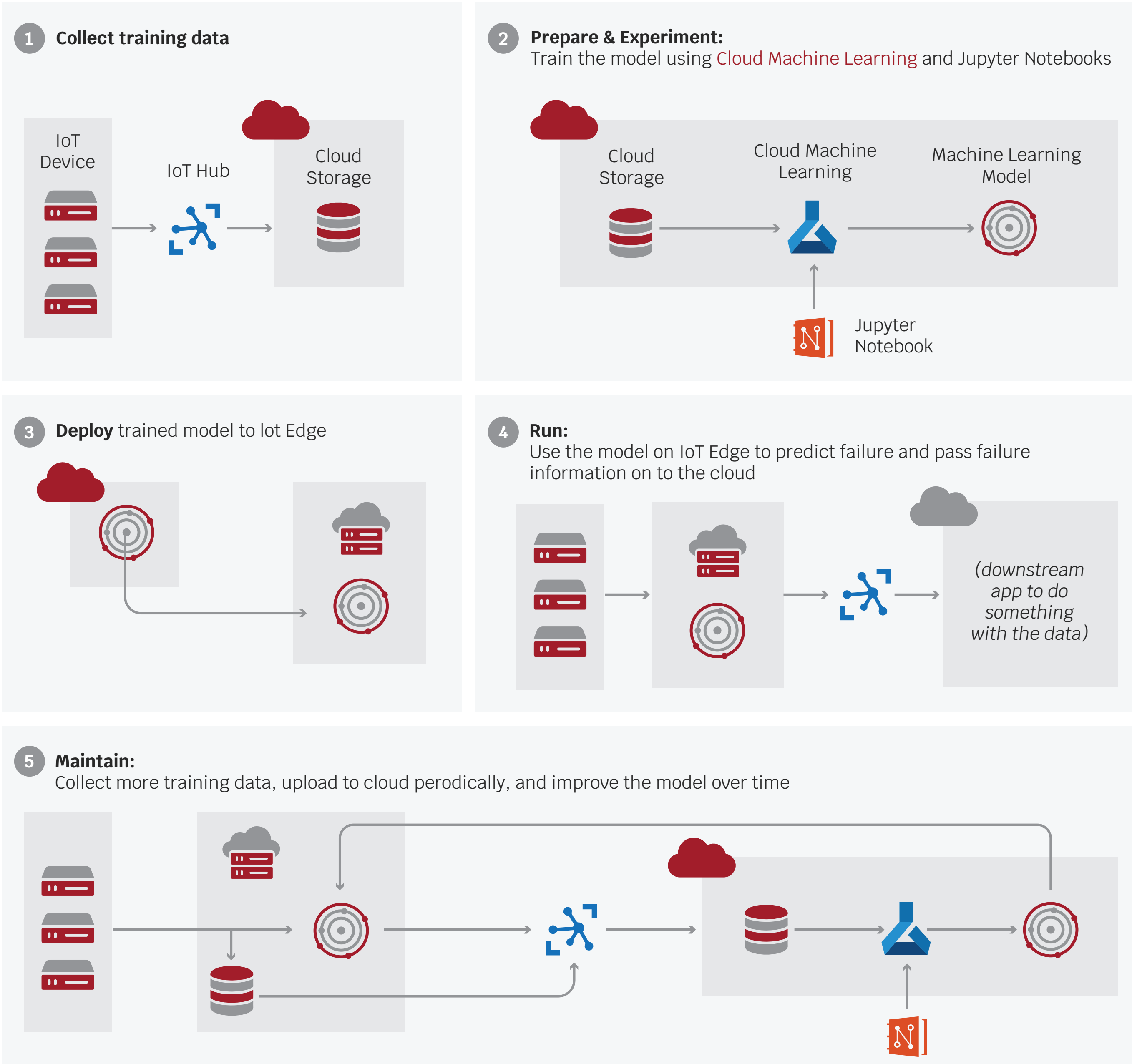

Diagram 3. *IoT, edge devices, and the cloud*

Big Data

Big data is a combination of structured, semi-structured, and unstructured data collected and analyzed by organizations. Due to its large volume, velocity, and variety, it is nearly impossible to manage big data using traditional data processing software.

The global big data market is expected to grow at an 18% CAGR (Compound Annual Growth Rate) between 2021 and 2025, and reach about $90 US billion. The total amount of data created, captured, copied, and consumed globally is expected to surpass 180 zettabytes by 2025. The COVID-19 pandemic has a big role to play in this, with companies adopting remote work, becoming far more data-driven, and creating large amounts of video content e.g., recordings of virtual meetings and presentations.

The public cloud is an ideal low cost environment designed to handle the challenges of big data. As the use of big data increases, there is no doubt that this will generate additional innovation in cloud technology specific to this use.

The Internet of Things

The Internet of Things (IoT) is a collection of data-producing devices that use an internet connection to transmit the collected data (e.g., temperature, speed,

vibration) or conduct actions like controlling devices. Some IoT devices can have additional processing power that enables analysis and decision-making on the device itself, without having to transmit the data to the cloud first.

The IoT market is expected to grow at a [CAGR of 27% from 2021 to 2025]. Currently, there are approximately 10 IoT devices per household. The number is expected to reach 50 by 2025. This, combined with the massive amount of IoT devices deployed by businesses, will contribute 79.4 Zettabytes, to the total storage of around 180 ZB by 2025.

All in the Cloud

While it is possible to store and analyse data on premise or in a private cloud, this article focuses on the benefits of public cloud, with one of the main ones being low costs and the ability to scale as needed. An additional benefit of hyperscalers (AWS, Google, and Microsoft) is that they have an accelerated rate of development of new features and products that customers can use without having to develop them on their own.

A great example of this is Amazons Recommendation engine. This machine learning technology can be attached to any e-commerce site and configured to make recommendations to customers based on their selected purchases. Amazon's recommendation engine has led to 35% of all purchases made on Amazon.

IoT devices feed data into the cloud. There, the data is stored, classified, cleaned, and combined with other data sources. Then, it is analyzed either by big data platforms like Hadoop or native machine learning functionality that sits within the hyperscalers' product line, e.g., Amazon SageMaker. The results can then be acted upon by either creating a feedback loop to the IoT device to create an action or alternatively it may inform a particular management decision e.g. comparing wear and tear in competing engine parts and making a decision on which one to go with.

With the growth of IoT devices and data feeding into the cloud, we would expect the growth in cloud to mirror the growth seen in these two technologies. IDC expects the CAGR of public cloud to be over 21.0% through 2025, reaching a total $809 US billion.

1+1+1=1000

It is clear to see the synergistic relationship between IoT, big data, and the cloud. While each component has its individual value, this value increases exponentially when they work in cooperation. Such technologies will only improve and get more affordable as their use increases. The ever-decreasing cost of IoT sensors and devices, coupled with the democratization of technology through the public cloud, makes these technologies affordable for smaller companies too.

While I have only looked as far as 2025 in this article, I have no doubt that the amount of devices, sensors, and data points will only continue on the current exponential growth curve. With more data feeding into the system, we gain more information and more knowledge, hopefully leading to greater insights and a better future for all.

Kevin Derman
Emerging Technology and Cloud Evangelist

Kevin Derman is an Emerging Technology and Cloud Evangelist. He is an engaging keynote speaker and podcast host of **The Emerging Tech Podcast**. Holding an MSc in Science and an MBA, Kevin has been involved in the technology space for over 20 years and was instrumental in building out the cloud ecosystem in South Africa over the past 10 years. He was the cofounder and CEO of Kaskade.Cloud, a cloud consultancy and has headed up the Partner and Channel Strategy both for Microsoft South Africa and IBM for the Sub-Saharan Africa region. Kevin now resides in Toronto, Canada.

Improving Organizational Performance through the Application of Big Data

BY MARIO BOJILOV

1. Introduction

The constantly increasing use of digital technology, both by organizations and consumers, has led to an explosion of new data coming into existence. Using ever more powerful devices, consumers are sharing media files with growing quality and, thus, size and using wearables, for example, health monitors, that are always on and generating data. On the other hand, organizations are persistently deploying new digital infrastructure, such as sensors, intelligent farming equipment, inventory trackers, to name a few that provide constant flows of data.

According to IBM, in 2020, every person on Earth generated 1.7 megabytes of data per second. In a similar vein, Forbes predicts that by 2025 more than 150 zettabytes of real-time data will need analysis. Organizations are taking advantage of the growth of Big Data, and some are using it very proactively. For example, the Business Application Research Center (BARC) states that organizations reaping the benefits of Big Data report an increase of 8% in revenue with a simultaneous reduction in costs of 10%.

This article will present an overview of Big Data and offer advice on how organizations can use Big Data to improve their performance in several areas.

2. Big Data Primer

The first discussion of Big Data appeared in an article written by Mr. Doug Laney, an analyst at Forrester Research at the time, in 2001. The paper did not mention Big Data but discussed for the first time the three main characteristics of Big Data: Volume, Velocity and Variety. The term Big Data only started appearing online in 2006-2007 and has taken hold since then.

Today, a Google search for Big Data definition will produce 1.96Bn results. However, this type of variety inevitably results in significant confusion around what Big Data is and when organizations need to start looking at specific applications and solutions related to Big Data. Furthermore, considering only the amount of data is not always sufficient since some organizations routinely process hundreds of terabytes per month, while others struggle with hundreds of gigabytes.

Instead, one way is to look at Big Data in a business-centric manner and consider its effectiveness within an organizational context. This perspective leads to a definition focused purely on business value and not on technical aspects - *We are dealing with Big Data when we cannot obtain required information within the timeframes necessary for it to be adding value to organizational activities.* Or, to rephrase, organizations need the information to be available before certain events; otherwise, it is unusable.

2.1. Characteristics

The three Big Data characteristics or 3V's, identified by Mr. Laney in his work, form the foundation used to build Big Data business initiatives and technology infrastructure. While new characteristics constantly appear and broaden the original definition, they often seem redundant and pretentious, created with a marketing purpose in mind. The original 3V's are discussed below.

2.1.1. Volume

As the name implies, this characteristic refers to the size of the datasets that need to be processed. When discussing volume, first, we need to define how it is measured. As consumers and professionals, we are familiar with kilobyte, megabyte, gigabyte.

However, Big Data volumes go well beyond any of these quantities. Thus, a definition is necessary at this stage. The list below provides an explanation of terms used to measure data quantities, expressed as bytes, at present:

- **Kilobyte – 1,000 bytes**
- **Megabyte – 1,000 kilobytes**
- **Gigabyte – 1,000 megabytes**
- **Terabyte – 1,000 gigabytes**
- **Petabyte – 1,000 terabytes**
- **Exabyte – 1,000 petabytes**
- **Zettabyte – 1,000 exabytes**
- **Yottabyte - 1,000 zettabytes**

The above definitions are the so-called "decimal definitions" considered by the law courts to be the most appropriate in trade and commerce. The underlined volumes are the ones that are considered Big Data.

To put volume in context, it is worth noting that, according to IDC, in 2018, the amount of all data on Earth was 33 Zettabytes. This amount will grow to 175 Zettabytes by 2025.

Moreover, the emergence of COVID-19 and the associated rise in digital technology usage are likely to increase this figure even further.

2.1.2. Velocity

Velocity is the 2nd characteristic of Big Data. It refers to the speed of creating data and the rate of processing and consuming data. The emergence of new business models, innovative applications, and widespread use of portable devices has increased velocity significantly.

The US Federal Reserve estimates that in 2012 a total of 24.4Bn general-purpose credit card transactions were made, while in 2018, that figure grew to 40.9Bn, an increase of 68%. Moreover, the electronic payments trend will further accelerate because of COVID-19, since electronic transactions were the only option for most during the lockdowns, and now people are very comfortable with digital technology.

This trend, however, was visible even before the pandemic when banks started reducing the number of their Automated Teller Machines (ATMs) in some countries, like Australia.

The increased e-payment volumes are just some examples of increasing data velocity. Another example is social media. For example, Microsoft, LinkedIn's parent company, reports that in Q4-2020, the engagements are up by 31% on LinkedIn. These engagements include text and other types of data, such as video, audio, graphics, etc. And, this assortment of data brings us to the last characteristic of Big Data - variety.

2.1.3. Variety

When related to Big Data, Variety refers to the type of data sources that need to be processed. There are three main types of data sources we need to deal with:

- Structured
- Semi-structured
- Unstructured

Structured – this data resides within enterprise systems, and its structure is well defined. Examples include Payroll, Finance, or other ERP systems.

In each case, a database stores all data. An example of such a data record is an HR system's employee record. It will contain as a minimum an employee ID, first name, last name, and other fields, as required. Structured data has been around since the early 80s. It is the easiest to process and is the smallest of the three types in terms of quantity.

Semi-structured – this data type consists of large volumes of individual records with small size and a simple record structure. An example would be the data sent by an intelligent power meter to a central system.

Each packet has the same format: timestamp – 10 bytes, location–10bytes, consumption–10bytes+other information – 80 bytes. Thus, information about electricity consumption takes 110 bytes. However, the 110 bytes is misleading since the daily volume in a city of 500,000 households with 5-sec intervals will be 950GB (110*12*60*24*500,000). Within a month, this dataset will grow to 11.4 Terabytes, and after one year, its size will reach 137 Terabytes.

Intelligent electricity meters are just one example of semi-structured data. With the continued proliferation of Internet-of-Things (IoT) devices, semi-structured data will be the fastest-growing one of the three types. Unstructured – strictly speaking, this data is still structured. However, in this case, we're dealing with many different structures and formats. A more accurate term will be multi-structured; however, unstructured is currently used for one reason or another.

Examples of unstructured data include social media posts, such as audio, video, graphics, and text. Additionally, external systems, data from enterprise sources, such as Word files, emails, and PDFs, are included here.

Figure 1 shows the wide variety of data items generated every minute in 2021. Some highlights contributing to Big Data include users sharing 240k Facebook photos, watching 16 million TikTok videos, and hosting 856 minutes of Zoom webinars.

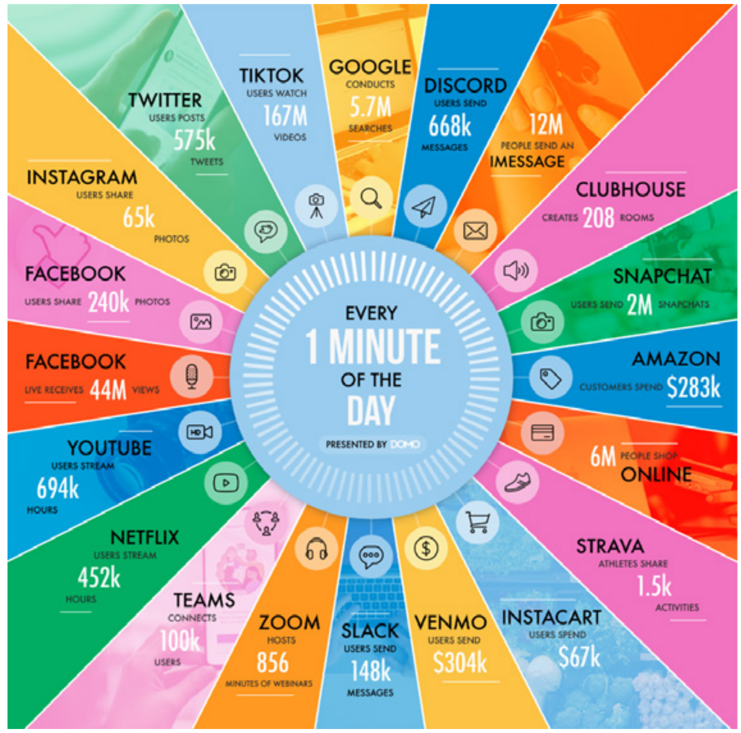

Figure 1. Internet Activity per Minute of Day in 2021. Source: domo.com

2.2. Big Data Primer – Summary

Figure 1 highlights the continuous significant growth in Big Data in all three characteristics - volume, velocity, and variety. However, this infographic presents only part of the picture - the data generated by the activities of individual consumers. Even higher data volumes are coming from organizations in various industries. And, this growth in Big Data is sure to accelerate significantly during COVID-19 and afterward, as organizations adopt new technologies and deploy new infrastructure, while "connected" consumers adopt new ways of connecting, shopping, and working with great confidence.

3. Big data applications in improving organisational performance

Considering the large number of possibilities Big Data provides for organizations, it can be daunting sometimes to decide where to start.

The first thing to consider is that Big Data is not a technology but a business initiative. In Big Data, as in any other project, focusing on technology at the expense of business benefits is a recipe for failure.

A helpful approach in deciding where to apply Big Data in an organization is evaluating the organizational value chain. Michael Porter developed the value chain in his 1985 bestseller - Competitive Advantage (Figure 2). To create value for its customers, an organization needs to perform these activities. According to Porter, the activities are directly linked to competitive advantage and their analysis to superior performance.

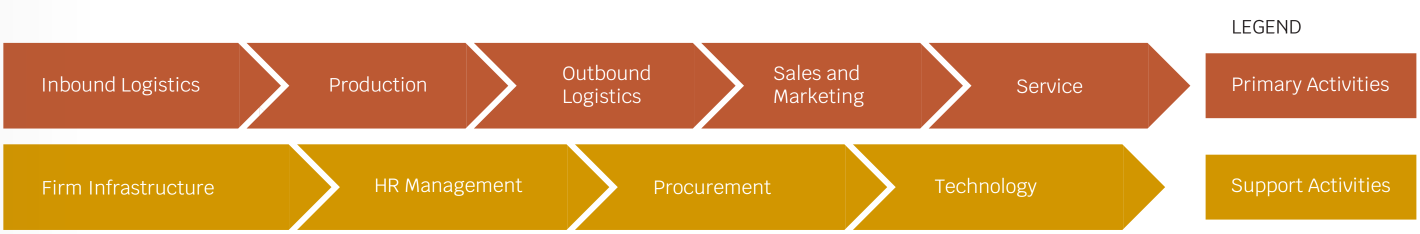

Figure 2. Porter's Organizational Value Chain

Since both Big Data and Porter's value chain focus on competitive advantage and performance improvement, using the value chain as a guide for Big Data is a natural fit. Each one of the activities is a suitable candidate for a Big Data approach, but it helps to focus on a single one at a time. Every organization will determine the starting point depending on multiple factors, such as strategy, industry, external market forces, organizational culture, etc. Several examples are of possible Big Data applications are discussed below.

3.1. Procurement and fraud

Association of Certified Fraud Examiners (ACFE) estimates that occupational fraud is responsible for a 5% loss in organizational revenue (Figure 4). Many fraud schemes exist, with the most prevalent of them being billing fraud, which is part of the procurement cycle (Figure 5). Consequently, using Big Data to detect and prevent billing fraud will significantly impact profits and performance.

Figure 3. World-wide fraud statistics 2020 (Source: acfe.org)

A method to use Big Data against billing fraud is to combine emails from suppliers, transactions from the procurement system(s), successful tender, and preferred suppliers selection. The resulting dataset then is analyzed to identify the preferential treatment of suppliers, pointing to bribery; discrepancies in purchase orders, invoices, and receipts - resulting in overbilling or under-delivery; unusually close relationships between suppliers and specific employees, revealing conflicts of interest.

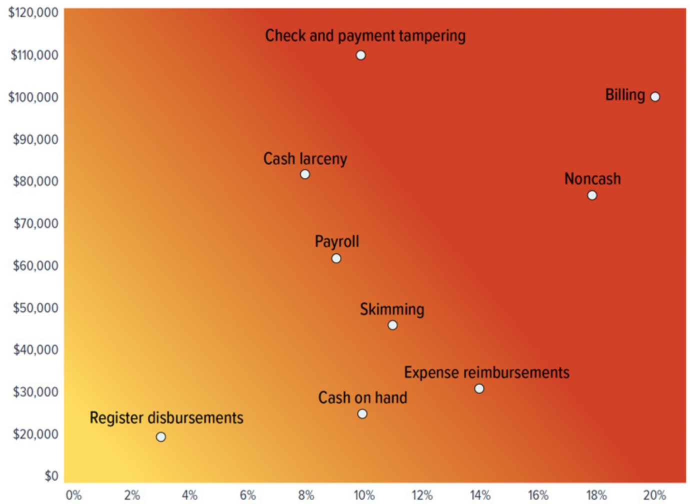

Figure 4. Fraud Schemes by Risk Level 2020 (Source: acfe.org)

3.2. Sales and marketing

Personalization is key to reaching more consumers, as every marketer will confirm. With the expansion of Big Data and related solutions, brands are increasingly using Big Data to improve their marketing efforts and bottom lines.

One example is McDonald's, moving from mass marketing to mass customization. The drive-through menus change in specific McDonald's restaurants depending on the time of day, weather, and historical sales data. Thus, cold drinks will feature more prominently on hot days, and instead of "Would you like fries with that?" customers may be offered a coffee with their breakfast.

Netflix is another company using Big Data extensively to ensure customer retention. For example, Netflix records what shows users are watching and at what time of the day, how are they doing it - binge-watch a series or taking a few days to finish a single episode, in addition to the type of movie and its genre. In addition, the company is planning for the ultimate personalization, creating individual trailers for each subscriber. This type of Big Data effort by Netflix underpins its stunning customer retention rate - 93%.

3.3. HR Management

A global fast-food restaurant chain applied Big Data to improve recruitment, training, and managing staff. The organization analyzed its internal structured data, unstructured data in the form of surveys, and semi-structured data, coming from sensors worn by employees during their shifts, tracking their movements and intensity of interactions.

The complete data set consisted of 10,000 data points, including data on individuals, shifts at different days of the week, the financial performance of outlets, and covered four US markets. The data set was then analyzed using Big Data and Artificial Intelligence techniques. The analysis uncovered a cluster of exciting insights, shown in Figure 5, challenging and confirming conventional wisdom. For example, previous experience and compensation structure didn't matter much, while the length of shifts and commute distance impacted outcomes.

After four months, this Big Data initiative created substantial benefits for the chain - customer satisfaction is up by 100%, and sales increased by 5%.

4. Summary

The growth in Big Data was significant before 2020, but COVID-19, due to the restricted movement of people and goods and the resulting expanded use of digital technology, undoubtedly accelerated that trend. Consequently, organizations are now accumulating significant amounts of data. Those who make a sustained effort to harness its power will thrive; the rest will merely survive in a best-case scenario.

This article provided an overview of Big Data and its characteristics and examined specific examples of how Big Data can improve organizational performance. It is important to remember that any Big Data initiative needs to start with a business outcome as its focus. Organizations with little experience in the area are advised to use Porter's organizational value chain as a starting point.

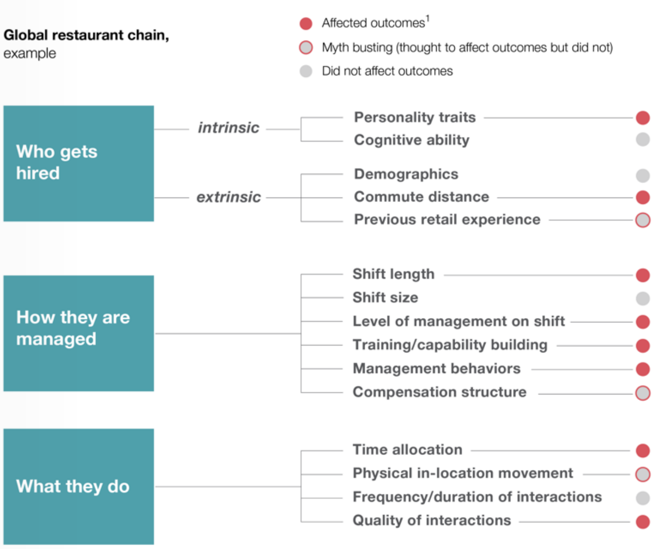

Figure 5. Factors affecting outcomes in a global restaurant chain

Mario Bojilov
CEO of Meta Business Systems,
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Mario Bojilov is a Certified Information Systems Auditor and a Lecturer in three major Australian Universities. He has worked in Data Analytics and Business Improvement since 1994. Mario founded Meta Business Systems (MBS), incorporating MBS Academy, in 2004, where he is currently the Chief Executive Officer. The company focuses on business improvement, performance monitoring, and technology governance.

Over the last 15 years, Mario Bojilov and MBS Academy have taught 1,500+ university students and 450+ professionals in the areas of Finance, Digital Technologies, Digital Risk, and Audit. In addition, the company delivered industry training in Australia, South-East Asia, and the Gulf.

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Show Your Gratitude This Holiday Season

Gift ideas for this festive season

As the pandemic continues to impact our lives, sharing love and appreciation with your family, friends, and coworkers is now more important than usually. The holiday season is an ideal time of the year to do just that. Actions speak louder than words, so the best way to show your love and appreciation is through gifts. You can make your loved ones happy with a simple gesture.

Here are some ideas to help you with your holiday shopping this season.

1. Ōura smart ring

These smart rings are an ideal gift for a friend, family member, or even business partners who are interested in physical activities and may enjoy a simple tracking accessory. The rings track blood oxygen levels, heart rate, sleep stages, daily steps, and calories burned. In addition, they have a very elegant design, fit for any environment.

2. Holiday spirit gift box

Commonly filled with a collection of themed items, this gift can strengthen relationships and make people feel appreciated. This box lets you show that you know the person and care about them enough to find different items that speak to their personalities, interests, and needs. From soaps, bath bombs, mugs, clothing, to even their favorite snacks, anything goes. The great thing about a gift box is that it can be customized down to the smallest details for the person receiving it. Additionally, you can also customize the gift to your budget.

3. Ember smart mug

Does your friend, relative, or coworker love to start their day without a cup of tea or coffee? If so, a smart mug might be the perfect gift for them. Ember smart mugs control and regulate the temperature of the drink to a desired temperature. In addition, they are eco-friendly and come in different designs, making them adaptable to any interior. These mugs can even function as a companion on your way to work.

4. Wine advent calendar

We all know a wine lover. For such people, the best gift would be an advent calendar to receive a daily treat in the countdown to the end of the year festivities. There is a great variety of options to choose from, and the selection process itself can be very exciting.

If your friends happen to be specific about their wine taste, then they have already made the choice for you.

5. Echo smart speaker

Technology keeps increasing the efficiency of our daily activities. Powered by a virtual assistant, smart speakers are able to answer questions, play your favorite playlist, set timers, reminders, and alarms, as well as control any other smart devices in your space. They are an ideal gift for a loved one's home or office environment. They come in a multitude of designs, functionalities, colors, and even price ranges, so it is very easy to find the right one for your loved one.

6. Wireless charger: SIIG SMART 10-Port USB charging station

A charger that can be used at any place and without cables can be a great fit for any person that lives an on-the-go lifestyle. This wireless charger has the ability to charge three devices simultaneously, making it a perfect gift for people that use multiple electronic devices in their daily lives.

Big Data as a Weapon to Fight against Corruption

BY ANDRES SARCUNO

The corruption of resources to the people who need them undermines trust in institutions and exacerbates the great inequalities in today's society. For this reason, the fight against corruption is one of the most relevant demands of the global community since the end of the 20th century and costs the global economy every year 3.6 trillion dollars per year, as mentioned by the Secretary-General of the National United in your message for the international day against corruption. And, the aggravating factor is that those less developed countries are the most vulnerable to suffering the consequences. In response, since 1997, the members of the OECD have established the need to criminalize the bribery of public officials abroad, which has resulted in the emergence of national laws that impose sanctions on legal persons for this type of activity, and/or the allocation of more financial resources to prevent and investigate them.

To cite an example, for bribery cases committed under the jurisdiction of the United States Justice, the sanctioned companies have paid an average fine of USD 42,960,203. In this context, organizations have been encouraged to develop and/or strengthen their anti-bribery management systems in order to be able to identify early outflows of funds that could be destined for the bribery of a public official and, in this way, avoid exposing oneself to sanctions, not only economic but also reputational and operational.

This objective is very challenging for companies since the scheme to disguise the payment of a bribe can take different forms and be easily hidden in their accounting because of the lack of sufficient data about the economic transactions. As the delivery of cash directly to the public official would be very uncommon, we can detail some vehicles (modus operandi) that have been used to commit bribes:

- Give lavish gifts directly to the public official. The company usually does not know if the beneficiary of the gift is a government official.
- Hiring a supplier who turns out to be an entity linked to the public official. The company usually does not know 100% information about the ultimate beneficial owners of a vendor.
- Third-party payment of the bribe through the hiring of a provider for services not provided later or are overpriced. It is very difficult to collect and analyze sufficient information about every transaction.
- Donating to a non-profit organization linked to the public official. The company usually does not know 100% information about the ultimate beneficial owners of a donation.
- Hiring an employee that is recommended by the public official. The company usually does not gather enough information about all applicants.

- Paying the bribe through payment in advance to a vendor that is later written off. It is very difficult to collect and analyze sufficient information about every transaction.

Inevitably, it is relevant to have a mechanism that allows identifying suspicious transactions that require an in-depth analysis just by reviewing the accounting records of the organization itself. Today, this selection of transactions is made from a manual review of accounting records by experts in the detection and investigation of corruption, who use their judgment and choose those that are most suspicious. To carry out this procedure, they use their accumulated knowledge of previously investigated cases and the search for certain characteristics in the transactions, such as the accounting account where the outflow of funds was imputed, the amount, its nature, the beneficiary of the payment, etc.

In other words, they label (classify) transactions that may be suspicious and then be analyzed in detail. The disadvantage of this process is that it is very difficult that all sensitive transactions can be classified due to the number of accounting records to be reviewed, increasing the risk of not detecting an outflow of funds linked to the payment of a bribe. Likewise, the particular analysis of the transactions classified as suspicious implies a cost for the organization, therefore, choosing them correctly also becomes relevant.

Having said this, the primary weapon to fight against corruption is information. If you have enough data about the transaction, it is very unlikely that a corruption scheme could be performed. The lack of information allows an employee of questionable morals to give something of value to a government official to obtain privileged information about a public tender. The vehicle to do that could be -for example- buying airline tickets in first class for the government official family. If the company does not have enough information about the transaction, it is easy for the employee to hide this expense as a regular organization spending. And, for sure, it is difficult to connect the public tender with the employee and the government official.

However, if you know all the current and potential connections between a government official and all the employees, vendors, and third parties of a company, you are in a position to easily identify an inappropriate benefit received by that government official from the company. Of course, it is very challenging to gather information about all current and potential connections between them. There are many different sources of information to be analyzed that provide structured to unstructured data. In addition, there is a lot of information from internal databases and public sources to acquire a better understanding of each transaction under analysis: economic activity, accounting account, number of employees of the supplier linked to the transaction, number of inhabitants of the supplier's fiscal domicile, amount, type of organization of the supplier, text that describes the transaction, if the provider has a website, adverse media and negative reputation, if the provider appears in a watchlist or a data leak (like Panama Papers, etc).

How is data changing the fight against corruption?

Nowadays, Big Data and automation technologies are being used as tools against corruption and in enhancing governance and transparency. To stay ahead of advanced bad actors and meet the rising expectations of regulators, organizations are investing more into technology to enhance their internal compliance programs.

Many are pushing for governments to start using technology to fight corruption. Since AI is being used as a tool against corruption, big data and analytics will contribute heavily to that process as well. Having started with apps, such as iPaidABribe, allows citizens to report any encounter with corrupt officials, generating rich data sets for anti-corruption activists. However, big data grants the ability to mine huge amounts of data for patterns that reveal corrupt activity, making it a very powerful tool. As an analytic method, it needs a massive amount of data to uncover previous correlations. For instance, big data techniques can uncover fraud or bribery patterns by combing through datasets on government bidding processes, contracting firms' financial disclosures, public officials' tax records, and the correlation could be quite meaningful. Although big data seems like a cutting-edge technological approach to fight corruption, it has been around for decades, getting more progressive with each day.

Here is an example of how big data is being used: These new projects are similar to Checkbook NYC, which has been around since 2010 and whose motto is "Government Spending at Taxpayer's Fingertips." Checkbook NYC is a portal established by the Comptroller of the City of New York to let citizens monitor the city's $70 billion annual budget using its own internal accounting data. Citizens can download the data and use Big Data analysis techniques to reveal patterns that might indicate corruption — a powerful deterrent. Checkbook NYC is open-source software that other cities can copy and use for themselves.

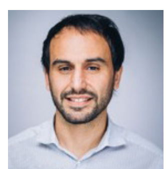
In addition, another example of how organizations can use data analytics to identify risky transactions is the case of Microsoft. They asked PwC to design an innovative solution that can help them not only detect corruption but also help to avoid that these potential risks from becoming issues.

Through the use of technologies such as data visualization, artificial intelligence, machine learning, etc., this solution provides real-time compliance reviews during the sales deal lifecycle. As such, they uncover corruption risks by identifying trends, relationships, and irregularities. In order to be able to identify "high-risk deals", a new operating model was created which will "flag" these transactions.

Being able to identify corruption risks in the early stages will help organizations to reduce the risks, as well as review the measures in place, if they are effective or not.

In conclusion, if the company wants to fight corruption, it must embrace big data. Corruption schemes are not too sophisticated. Organizations do not extract, transform and load all relevant data they need to detect it. In order to prevent -for example- a conflict of interest, you have to create a data lake where you can collect all the information about your business ecosystem: social networks, media, public entities records, and the internet. Once you have it, you will be able to build a graph database where you can see if a vendor and employee are connected.

These are examples of what you can do nowadays. There is a lot of data waiting to be exploited to improve the way companies fight against corruption.



Andrés Sarcuno
CFE, CIA, MBA
Director, Forensic Services Practice, PwC Argentina

Andrés Sarcuno is Director in the Forensic Services practice for PwC serving Argentina. Mr. Sarcuno specializes in anti-corruption investigations and forensic accounting matters in Argentina for a diverse group of clients from different industries such as Pharma, Retail, Oil & Gas, Agriculture, Chemical, Financial Services, Government, and Telecommunications. He also has led investigations involving allegations of bribes and kickbacks, fraudulent disbursements, embezzlement, and inventory misappropriation. He also worked with other offices of PwC and corporate auditors to conduct FCPA and anti-corruption assessments across Latin America.

Andrés is an Executive MBA of the IAE Business School and is graduated in Accounting from the University of Buenos Aires. He is a Certified Public Accountant in Argentina, a Certified Fraud Examiner for the Association of Certified Fraud Examiners of the United States (ACFE), Certified Internal Auditor for The Institute of Internal Auditors (IIA), and he is certified as a Data Scientist.

PECB ANTI-BRIBERY CONFERENCE 2022

PECB Conferences have become events that attract global experts and professionals working directly with ISO standards or relevant fields. Our Insights conference, held on November 2021, had an amazing turnout and was very well received. Click **here** to view the conference recordings on our official PECB YouTube channel.

We hope to have a similar reception for our next virtual PECB Anti-Bribery Conference on February 21-22, 2022. The conference will have a round table discussion format and address key issues and challenges related to bribery and corruption. With a highly insightful **program**, our experts will dive into detailed discussion about topics such as the future of ISO 37001, Whistleblowing, the fight against corruption, cryptocurrency, and more. Our stellar selection of esteemed anti-bribery professionals as panelists will make this event highly engaging and beneficial.

The PECB Anti-Bribery Virtual Conference 2022 will be a two-day event, hosting six sessions a day, delivered by over 30 distinguished experts in 3 different languages: French, English, and Spanish. It is a great opportunity for anyone interested on the latest trends and news related to Anti-Bribery and the ISO 37001 standard.

Registration for this conference is completely free.

REGISTER HERE!

Big Data Analytics Tools

Managing our data is becoming evidently more important by the day. With the rapid growth of technology and its integration into our lifestyles, the need to filter through data, to be protected from potential risks, or the need to be able to use this data to our advantage, has increased immensely. The most efficient way of doing so is through tools that ensure such services. With many tools at our disposal, these are some options for you to pick. Whether you need analysis as an individual or for you organization, these user friendly and free to download tools will assist you in your needs.

1. Knime – is an open-source data analytics, reporting, and integrating platform. It is a software that allows you to produce and create data science using graphical interference. Knime enables you to create, blend and transform your data, model and visualize data using provided tools, deploy and manage data science practices, consume and interact leveraging insight from your data. There are a lot of extensions offered, such as; personal productivity, performance, and collaboration.

2. Apache Hadoop – is an open-source project that uses many other analytical tools to improve data analytics operations. As a framework, it grants the processing of big data sets, designed to seize up; from single servers to thousands of machines. It works as a library that is designed to detect and handle failures of any application or computer cluster. Apache Hadoop works with a multitude of related projects that offer multiple big data analytics for organizations and individuals.

3. MongoDB – works in cooperation with Hadoop to help organizations create complete applications that reveal new opportunities from analyzing data.

It is a database that supports online, real-time operational applications driving sophisticated analytics and machine learning. The reach of these analyses is large, not only with individuals and organizations but whole cities implementing these analyses to keep track of crime, health care, or other key issues affecting citizens.

4. Tableau – is a platform that intends to make organizations be more data-driven through modern business intelligence that makes it easier to explore and manage data. Their main mission is to help people see and understand data, no matter their professional background. It visually shows data by transcribing drag-and-drop actions into queries through an intuitive interface, helping people transform data into actionable impactful insights. The easily accessible connection to data stored anywhere makes this tool very useful for individuals to global organizations.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Adel Abdel Moneim's Success Story

How it started

My passion for electronics and communication started at a very young age. It was a hobby that took most of my time throughout school and until I graduated university in 1996. At the time, information technology and information security were not even closely as widespread as now, with the exception of very limited business sectors.

After graduating from university, I immediately signed up for a post-graduate diploma at the American University in Cairo, where I received a professional certificate in computer systems and applications. At the same time, I was completing my MCSE certification and was one of the first few people in Egypt to get certified by Microsoft as a systems engineer. I also was one of the first ten Egyptians to become a Microsoft-certified trainer in 1998.

I had finalized my MCSE and MCT before receiving my diploma at AUC. This encouraged me to take more advanced courses in network administration.

This led to an amusing incident: I was studying at the AUC in the morning and teaching as an instructor in the afternoon, so for a while, I was both a student and a teacher.

My interest in internetworking led me to study CISCO technologies. I was one of the first Egyptians to become a CISCO certified instructor in 2004. In 2005, information security became my main focus. I received my first certification in ethical hacking in 2004 and started teaching it in 2005 as one of the very few certified individuals in Egypt at the time.

Since then, I worked solely in information security and its related domains, both as a trainer and consultant. The practical experience gained from work allowed me to provide students with personal hands-on practical information in addition to the textbook theory.

I am currently an APMG Accredited Trainer, Certified Trainer for PECB, CertNexus, and (ISC)^2, and EC-Council. I worked hard to obtain many prestigious certifications from industry leaders in different fields of cybersecurity, including but not limited to CISSP, CISM, LPT, NIST-NCSP, COBIT, TOGAF and SABSA.

Also, I am registered cybersecurity expert for ITU – ARCC (International Telecommunication Union – Arab Regional Cybersecurity Center) since 2014.

My journey with PECB

My journey with PECB started in 2014 when I received my first certificate: ISO/IEC 27001. This quickly became a series of certifications in ISO standards, which included ISO/IEC 27001, ISO 22301, ISO/IEC 27005, ISO/IEC 27032 and ISO/IEC 27701. I am proud to say that, to date, I have successfully obtained 25 different certification credentials from PECB, in addition to being a PECB Certified Trainer.

The most beneficial part of my 8 years with PECB is, of course, the experience with the implementation of international standards, frameworks, and best practices in the field of cybersecurity, information governance, cloud security, risk management, and data privacy and protection.

Hard work paying off

Since my early years right after graduation and as a result of hard work and dedication, I have received recognition and awards from all the companies I have worked with, as well as from various local, regional, and international organizations. I have been awarded instructor of the year/ circle of excellence awards for the Middle East and North Africa from EC-Council for 8 years in a row, from 2008 to 2016. I also received recognition from global organizations such as IFSEC Global, who awarded me top influencer in the field of thought leadership and cybersecurity, named number 2 cybersecurity influencer of 2021.

Although awards and recognition are not my objectives, they are, without a doubt, a major catalyst that encourages me to put in even more effort, hard work, and dedication. They are both a reward and a return on all the effort and time invested in my professional career and fuel that make me push harder at what I do. This is especially important in a field like mine, where you face new things every day. It is one of the most dynamic fields that require a lot of effort to keep up to date with the changes and improvements around.

As precious as the awards may be, to me, the biggest reward is seeing the success of any person I taught across the years. Words cannot explain the feeling of seeing a former student of mine accomplish their dreams, strive towards success, and reach high positions in the field. This is a true legacy, to teach and to be blessed enough to see successful results.

Freelancing

When I first started working, fresh out of college, I worked as an employee in a company. For the following seventeen years, I worked in several corporations, became General Manager, and acquired my MBA from Maastricht School of Management in the Netherlands in 2009.

In 2013, I started working freelance as a trainer and consultant. Working freelance has advantages and disadvantages. In my opinion, a freelancer is like a stand-alone company. Your time, your connections, and your experience are your capital. You have to choose wisely which areas you want to dedicate your time, effort, and money on; which are worthy of your investment and which are not.

Just like any company that can face financial challenges, being a freelancer is also financially challenging to acquire technical competencies.

Some of the difficulties of freelancing are keeping up to date with the constant changes, updates, and developments in the field. In order to do so, one has to maintain and update all relevant international industry certifications. One has to be aware of the changes in demand of the services offered and work accordingly to provide what is needed. Flexibility is key; one needs to be able to adjust to the ever-changing market needs, as well as the constant development of the services offered.

Freelancers need to be able to have both a deep understanding of technical aspects and the business knowledge needed to succeed. For example, minimal knowledge of legalities is necessary to avoid contractual problems.

On the other hand, there are many positive aspects to working freelance. Unlike working in a company, working on my own gives me the flexibility to choose the specializations I want to work in. Going back to my previous point about the necessary investment needed to keep up to date in the field, this reflects directly on the success of a freelancer. The more you invest in your career and certifications, the more qualified you are to work as a consultant. This, in return, reflects directly on the success rate and overall income.

All the hard work, effort, and success will be reflected upon the person directly. This can also be a double-sided sword, another reason why being a freelancer is a lot of hard work.Finally, I want to point out that a freelancer's main investment is his reputation, be it personal or professional. This is what makes or breaks a freelancer.

Volunteer experience

In December of 2010, I was elected as the Head of Information Security workgroup under the umbrella of the Egyptian Chamber for Information Technology - CIT, a position that I hold dear for the past eleven years. Our objective is to aid local companies to develop their business in the local/regional market and raise awareness about the importance of cybersecurity to support digital transformation. Since 2015, I have been responsible for preparing and executing an annual cybersecurity conference under the same umbrella.

In 2015, I was honored to be nominated for the membership of the Industry Representative Committee of the NTRA, a prestigious group of industry experts who act as the prime consultants for national-level projects being reviewed or implemented by NTRA/MCIT. I joined this committee as a cybersecurity advisor.

In 2018, I participated as an official member of the Executive Regulation Development Committee (a committee of the Ministry of Communications and Information Technology), responsible for the development of various clauses of the Egyptian Cybercrime Law.

Over the course of five years, starting in 2013, I was honored to participate as a member of the Child Online protection Committee. It addresses children, parents, and educators in forms of workshops to raise awareness of the dangers that our children face on the internet.

Striving to support the community, I am happy to serve as a Chapter board member for the Cairo Chapter of the OWASP Foundation, a worldwide nonprofit organization focused on improving the security of software. I have done this since 2014.

A significant moment in my technical career was my recent participation in the Arab Cybersecurity Forum that took place in Tunisia in October 2021. I was selected to be part of the committee responsible for preparing a strategic vision for Arab Cybersecurity strategy under the umbrella of the League of Arab States. Moreover, I participated in developing and reviewing many courses for international exam questions from a quality assurance perspective, as a part of my efforts to share my knowledge with cybersecurity professionals everywhere in the world.

I find pride in this voluntary work because I feel it is our responsibility as experts to increase awareness and aid in the development of the industry. I have done so very early in my career by giving awareness sessions, holding introductory workshops, participating in forums, radio, and television programs. I find it is our duty to spread awareness, protect our children, and develop laws that are fair and implemented to protect the industry and its future.

Striving to stand out

Throughout my professional career, I always looked for unique opportunities, being one of the first in a certain certification, learning something new, and being distinguished in my areas of expertise. I am a pioneer of ethical hacking and penetration testing in Egypt. I have also explored the fields of digital forensics, mobile forensics, international standards and best practices, security enterprise architectures, and finally, governance, risk, and compliance (GRC).

GRC and security framework is my current forte. I spend most of my working hours either as a certified trainer for major certification bodies or as a consultant both nationally and internationally. In other words, my career has always been a source of inspiration to look for what's different, unique, or a niche, be it as a trainer or as an advisor.

ISO 22301 Lead Implementer eLearning Training Course in English

The ISO 22301 Lead Implementer training course, which aims to enable attendants to implement a business continuity management system (BCMS) based on the requirements of ISO 22301, is now available in eLearning format.

The training course helps establish a framework for organizations to continue operating efficiently during and after disruptive events. It will be available at any time and from any geographic location, at the attendant's convenience.

If you have any questions, contact us at **marketing@pecb.com**

CHECK THE BROCHURE!

GDPR — Certified Data Protection Officer (CDPO) eLearning training course in French!

The GDPR — CDPO training course is designed to help attendees acquire the necessary expertise to understand the risks that could harm organizations and learn how to implement the required strategic responses based on the GDPR best practices, requirements, and principles.

For more information, check the **link** or contact us at **marketing@pecb.com**

#BeyondClassrooms

THE NEW KATE VERSION RELEASED ON NOVEMBER 30, 2021

We are happy to inform you that the new version of our app KATE has been released on November 30.

The updates affect both the desktop (Windows and macOS) and mobile versions (Android and iOS). The updated KATE will have new features and design improvements.

Some of the new features that will show in all versions of the updated app include:

- Videos separated into sections
- Auto-play the next video
- The video progress bar that allows you to pick up where you left off
- The option to add notes in the eLearning videos

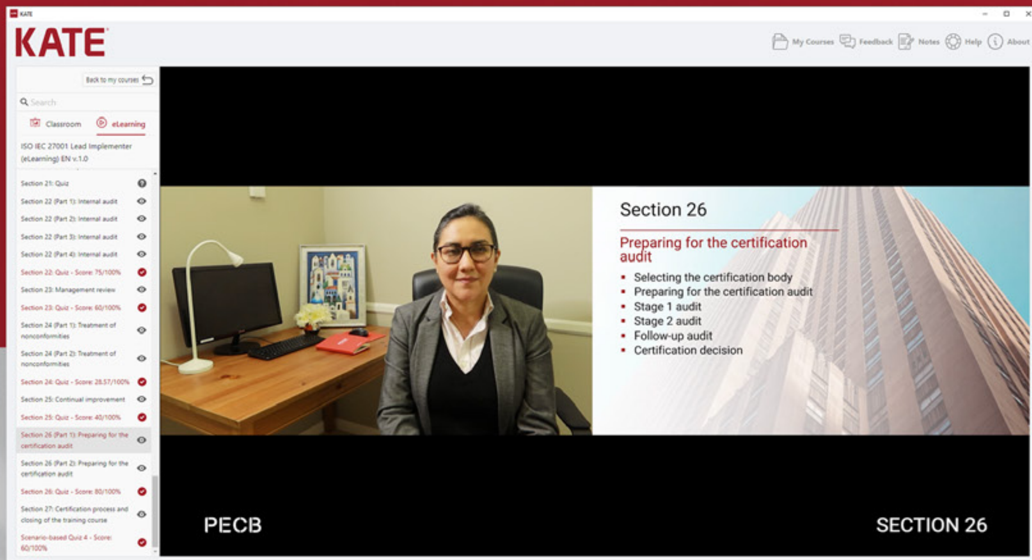
The mobile version also has the following feature:

- Video quality settings button inside the video player, as well as a "speed playback" button

The desktop version also has the following features:

- Giving feedback for the eLearning videos
- Bookmarks
- Opening the slide notes and the slide simultaneously
- Deleting "notes" and "feedback"

EXPLORE THE UPDATED VERSION! ▶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Section 21: Quiz
Section 22 (Part 1): Internal audit
Section 22 (Part 2): Internal audit
Section 22 (Part 3): Internal audit
Section 22 (Part 4): Internal audit
Section 22: Quiz - Score: 75/100%
Section 23: Management review
Section 23: Quiz - Score: 60/100%
Section 24 (Part 1): Treatment of nonconformities
Section 24 (Part 2): Treatment of nonconformities
Section 24: Quiz - Score: 28.57/100%
Section 25: Continual improvement
Section 25: Quiz - Score: 40/100%
Section 26 (Part 1): Preparing for the certification audit
Section 26 (Part 2): Preparing for the certification audit
Section 26: Quiz - Score: 80/100%
Section 27: Certification process and closing of the training course
Scenario-based Quiz 4 - Score: 60/100%
Section 26
Preparing for the certification audit
Selecting the certification body
Preparing for the certification audit
Stage 1 audit
Stage 2 audit
Follow-up audit
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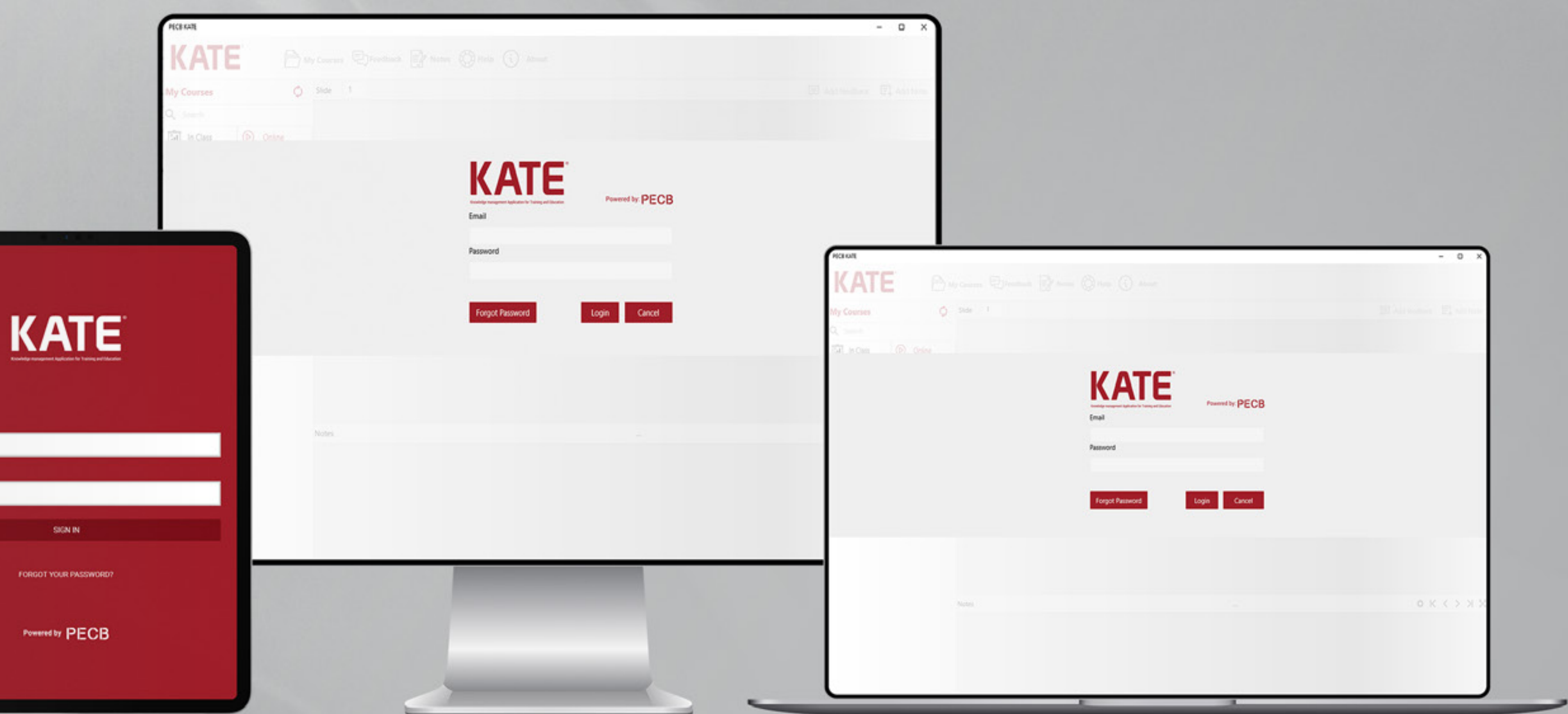
SECTION 26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Is Augmented Analytics the Future of Business Intelligence?

BY ROBERT RUIZ

One of New York City's well-known nicknames is The City That Never Sleeps. However, now it is the digital world that has connected an entire globe, not just a city that never sleeps. The digital world keeps us connected 24/7/365 in our lives. Every second, every person across all parts of the world is interacting with the digital world and creating data in a variety of ways.

With 3.7 billion humans currently using the internet every day, we have created nearly 90% of the world's data in the last two years alone. According to Statista, data creation will be over 180 zettabytes by 2025, which will be 119 zettabytes more than in 2020. For reference, a zettabyte is equal to trillion gigabytes – and one gigabyte can translate to 350,000 emails.

Data has and will become even more the lifeblood of an organization. The ability to get insights from this data explosion as quickly as possible will be critical to help evolve a company's business and operation models, as highlighted by the pandemic.

To handle this data explosion, our approach and use of business intelligence (BI) is undergoing one of the most dramatic & innovative shifts that we have seen in the evolution of BI. Let's take a brief review of the history and current challenges of business intelligence:

- **First was business intelligence 1.0**, which was led by semantic layer-based platforms. Requests from business users for information and data were provided to IT Analysts, who would run reports that could take days, weeks, or months to deliver depending on complexity. The final report was heavily numbers-oriented, and insights could take weeks to months to be delivered.
- **Then came business intelligence 2.0**, which saw the emergence of self-service analytics designed for business users to generate reports and data by using interactive interfaces that allowed for click-drag-drop functionality. Data visualization tools became heavily popular as they allowed for insights to be derived in days and hours.

While business intelligence 2.0 has greatly improved the level of analytics and insight, it still faces mounting challenges in organizations highlighted by:

- **Lack of Insight Generation** – Most dashboards deliver only a fraction of the insight needed to monitor and maintain organizational needs. Due to the massive amount of data explosion over the last 10 years, data discovery is now needed for most insight.

- **Adaptability and feedback –** Less than a third of a dashboard user base will log in to view company dashboards. Most of this user base will probably only use it once a month. Without adoption, we lack the necessary feedback to continuously improve business knowledge and improve insight intelligence.
- **Democratization of data –** Unfortunately, most organizations cannot provide dashboards to all users, as it would be costly. This limits organizations' ability to empower all employees to make data-driven decisions.
- **Data explosion and underutilization –** It is estimated that only 0.5% of data is being analyzed and used. Data collection continues to increase by 40-50% every few years, leaving a substantial amount of data unlevered. This unearthed data could be assisting in helping new & lost revenue opportunities, identifying quality issues, and so much more.

These challenges have now led us to the next evolution of BI.

- **Business intelligence 3.0**, which is being highlighted by a predominately app-centric approach to BI, with users having multi-device interfaces and helping to simplify data complexities democratize data to enable collaboration, social empowerment, and provide insights in real-time to all business users. The stage is being highlighted by augmented analytics to help achieve these initiatives.

Augmented analytics is defined by Gartner as an approach of data analytics that employs the use of machine learning and natural language processing to automate analysis processes normally done by a specialist or data scientist.

The field of Augmented Analytics is helping to achieve the following:

- **Augmented data preparation –** uses machine learning automation to augment data profiling and data quality, harmonization, modeling, manipulation, enrichment, metadata development, and cataloging.
- **Augmented data discovery –** enables business people and citizen data scientists to use machine learning to automatically find, visualize, and narrate relevant findings without having to build models or write code.
- **Augmented data science and machine learning** – automates key aspects of advanced analytic modeling such as; feature selection. This reduces the requirement for specialized skills to generate, operationalize and, manage an advanced analytics model.

These advancements are helping us achieve the primary goal of BI, which is to create value from data in order to obtain insights that can be acted upon by a company. The two primary types of insights that a company wants to obtain are:

- **Increasing revenues –** Examples of this scenario include identifying the factors that are causing MQLs to SQLS and then further converting to a successful sale while always considering the other side, what factors are preventing a successful sale, for example, are sales personnel reaching out in time and are they using the most desired communication methods by clients.
- **Eliminating costs or helping to create cost efficiencies.** An example of this scenario includes automating employees in order to perform higher value-added work for your company.

Augmented analytics will be crucial for delivering unbiased insights, recommendations, and impartial contextual awareness. It will transform how users interact with data and how they consume and act on insights with conversational analytics. This emerging shift is enabling people to generate queries, explore data, and receive and act on insights in natural language (voice or text) via mobile devices and personal assistants.

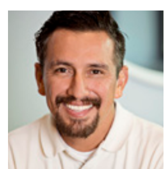
Insights in natural language are helping to create a more meaningful impact and impression in an individual's mind.

The most innovative and successful Business-To-Consumer (B2C) applications have been using advancements in augmented analytics to provide personalized and contextualize insights over the last few years. These companies have mastered the retention and analysis of their customer data and have effectively used such methods to create value for themselves and their customers. Let us look at the following companies:

- **Amazon "People who bought this product also bought these items"**: A recommendation system harnessing the massive amount of personal purchasing data in Amazon's ecosystem. This recommendation system has become a personalized shopping assistant that gives you the best suggestions for complementary items that you may want to purchase.
- **Uber "Relax and enjoy a ride for the holidays"**: Simple and effective nudges to push users to open the app and book a ride. Once in the app, users see a variety of machine learning models involved in the surge pricing that is beneficial for drivers and riders.
- **Netflix "We just added a TV Show you might like"**: Another recommendation system analyzing the viewing patterns of people with similar profiles and previous viewing experiences. In addition, the user feedback mechanism helps to improve the recommendation algorithm.
- **Nike Fitness "Take a brisk 15-minute walk to close your exercise ring"**: The use of nudging principles to help drive intended behavior and meet your stated goals. These types of insights prove how effective, simple and easy-to-digest insights can be to end-users.
- **Waze "Best Route, Usual Traffic – ETA 45 minutes to Destination":** An app whose maps and navigation are powered by users. The more people are driving with the Waze app open, the better the navigation experience creating live feedback and data collection process. The real-time information shared from your device translates to traffic conditions and road updates i.e., traffic, accidents, blocked roads, hazardous items on the road, etc.

In essence, each of these apps has created a personal, digital assistant for users to help them drive engagement and nudge behavioral actions by providing personal and contextualized insights - all brought to you by the power of augmented analytics.

As our B2C experience and expectations have evolved, expect this shift to make its way to our employers and our work lives. Work still accounts for a significant portion of our time, and companies should look to invest in augmented analytics in order to provide employees with a personal digital assistant to help provide the right insights at the right time to help them to perform better, make data-driven decisions, help employees to hone skills and preparing them for future opportunities in the company.



Robert Ruiz
Sr. Director of Customer Success at entomo

Robert Ruiz, MBA, CPA, is a Senior Director of Customer Success at entomo for their American market. He has over 20 years of experience in the healthcare, service, and software industries. During this time, he has been heavily involved in data analysis and reporting, helping companies to understand their data by using modeling, dashboards, and data storytelling. In his current role, he helps companies to understand how to use augmented analytics to improve their sales & marketing efforts, as well as boost company & employee performance and career development. He holds a Bachelor of Business Administration from the University of Houston, a Masters of Business Administration from the University of St. Thomas and is Certified Public Accountant.

Each day, entomo helps over 30 million users, teams, and organizations globally to perform better. Our solutions create compelling employee experiences starting from an employee's first impressions to working with their teams, helping to focus on performance to honing skills & growing in the company.

Robert can be reached via email at robert.ruiz@entomo.co, and entomo solutions can be viewed at www.entomo.co.

Training on ISO Standards and Skiing in Multicultural Almaty

The dynamic and ever-changing world continuously seeks qualified professionals in all areas of business. A qualified professional never stops learning and constantly strives for improvement to adapt to the needs and requirements of the business world.

Quality Management Center: The PECB Training Partner in Central Asia

Quality Management Center (QMC) was founded in 2002 in Almaty, Kazakhstan — the heart of Eurasia. In 2014, QMC became an authorized training partner and is licensed to provide PECB certified training courses and certification examinations for various ISO standards. Since this partnership was established, QMC held a number of training sessions and certification exams, from which, around

400 people from Kazakhstan, Kyrgyzstan, and Russia got certified. Through the partnership of the QMC with PECB and advanced information technologies, participants had the opportunity to learn from PECB certified trainers who are field experts from every corner of the world (Belarus, Bulgaria, United Kingdom, Latvia, South Africa). This became possible especially through online training sessions, which reduced physical distances to mere time zone differences.

Almaty: A Blooming City at the Foot of the Mountains

With a population of almost 2 million, Almaty is the largest city in Kazakhstan, and until 1997, it was the capital of the country.

Now, Almaty is called the southern capital of Kazakhstan. Archaeological research shows that the city was founded about a millennium ago. In 2016, the city celebrated its 1000th anniversary.

Today, Almaty is a modern metropolis; an economic, financial, and cultural center of Central Asia. It always welcomes the true lovers of active recreation, cultural events, entertainment, sports, and ecotourism.

Almaty is located at the bottom of the Zailiyskiy Alatau Mountains, the northernmost of the awe-inspiring mountain range of Tien Shan, which inspires people to take on new adventures and explore the beautiful wilderness. One can safely say that Almaty is defined by the mountains, the clear water rivers, and apple orchards.

Museums and Theaters

There are many museums, theaters, and art exhibitions in Almaty. Among others, visitors are recommended to visit the Central State Museum, Kazakh Museum of Folk Musical Instruments, Kazakhstan Museum of Arts, and Archaeology Museum. Opera and ballet enthusiasts can watch astonishing performances at the National Academic Opera and Ballet Theatre. Many concerts are held in the Kazakh National Philharmonic Theatre named after Zhambyl Zhabaev, a famous Kazakh folk poet and singer. The language of art is truly universal and tears down all boundaries.

Skating and Skiing in Almaty

Almaty has a relatively mild climate and it welcomes guests with warmth and sunshine during most of the year. The word "Almaty" can be translated as "Apple Tree", but visitors can find a lot more than just apple trees in this city. Besides the apple trees, the city streets and the local parks are covered by cherry trees, poplars, birches, spruces, pine trees, and lime trees, which, in spring turn the city into a blooming garden. In Almaty, there is also a beautiful botanical garden that offers visitors a unique experience.

In summer, visitors can admire the mountain rivers that cross the city and numerous fountains, or ride a cable car to the top of “Kok Tobe” mountain and enjoy the panoramic view of the city. In late autumn, winter, and early spring you can go ice-skating to the mountain-skating rink “Medeu” or enjoy skiing at the ski resort “Shymbulak.”

Ice skating rink “Medeu” is a sports complex built at the altitude of 1691 meters above sea level, 15 km from the center of Almaty. Medeu is visited by professional sportsmen which have set world sports records, but also by thousands of people who simply go there to relax and enjoy skating. It is the highest of the mountain skating rinks for winter sport and has the largest area of the artificial ice field that stretches about 10,500 m^2. The skating season starts in November and ends in March.

Located in the picturesque Trans-Ili Alatau gorge, 2260 meters above sea level, “Shymbulak Ski Resort” is famous for its mild climate and sunny days, a stable snow cover, and magnificent views. The snow cover on Shymbulak remains stable from December till April. This ski resort welcomes all skiing enthusiasts and it has slopes and routes for any level of skill, including downhill tracks and giant slalom tracks. As such, Shymbulak is visited by skiers who love smooth tracks, but also by snowboarders who prefer extreme jumps and turns that take their breath away. In addition,

the resort provides comfortable ski lifts, a ski school, a hotel, a restaurant, etc.

During the peak of the season, Shymbulak gathers thousands of visitors. The ski resort provides chairlifts to climb the Talgar Pass (3,163 meters above sea level), however, only professional skiers go up there because the descent from the pass is too steep for beginners.

Local Food

The Almaty cuisine and Kazakh cuisine, in general, are very diverse. Kazakh cuisine has adopted the customs and traditions of different ethnicities: Armenian, Georgian, Indian, Italian, Chinese, Korean, Russian, Turkish, Uzbekistani, Ukrainian, Japanese, and, of course, the Kazakh people. Kazakh cuisine is famous for its dishes consisting of meat delicacies and dough products. Everyone who will taste authentic Kazakh cuisine at least once in their life will undoubtedly want to taste it again.

Airport and Hotels

Almaty International Airport is the largest airport in Central Asia in terms of passenger traffic. Up to 200 flights from around 30 international airlines from all over the world land and depart in this airport every day.

There are numerous hotels available to travelers in Almaty, ranging from large and expensive five-star hotels to small and more affordable places. Each hotel serves breakfast which is included in the initial price.

Time Travel: Necropolis of Ancient Sakas and Scythians

The entire territory of the modern Almaty and Almaty region in ancient times was a spiritual and sacred center for the entire Saka world, where noble leaders gathered from distant corners of the great nomadic civilization (Siberia, Altai, the Black Sea region, and many other places of the Great Steppe). This has been confirmed by the archaeological finds discovered in the Boraldai and Issyk mounds.

There, the Sakis buried their chiefs and batyrs with great honor. The Boraldian mounds date to 8 BC and are a monument of the Early Iron Age. Issyk Kurgan, on the other hand, is believed to date back to 400 BC and is located 50 kilometers away on the east side of Almaty.

The famous Tamgala Tas archaeological complex is located 111 km away from the city. In 2004, UNESCO included it in their World Cultural Heritage List. The composition of the Tamgaly Tas petroglyphs are unique rock paintings and carvings. Historians date them back to the second half of the 17th century. Visitors can also climb the rocks along safe paths and enjoy the view of the river valley and the steppe expanses.

The Transcontinental Cities: Atyrau and Uralsk

Atyrau, otherwise known as the oil capital of Kazakhstan, is a transcontinental city that stretches in both Europe and Asia. The city is located in the western part of Kazakhstan, in the Caspian lowland, where the Ural River pours its waters to the Caspian Sea.

The harsh but generous lands of the Atyrau region are rich in oil and gas, and the river is full of commercial fish, specifically sturgeons. These resources greatly contributed to the development of the city and the region as a whole.

Uralsk is an ancient city located on the northwestern side of Kazakhstan near the Russian border. It was founded during the heyday of the Golden Horde in the XIII-XIV centuries on the banks of two rivers (Ural and Shagan), on the proverbial "border" separating Asia and Europe. Uralsk is a cultural, historical, and educational center, and its theaters, museums, libraries are great attractions for visitors.

Over the years, famous Russian poets and writers, such as Alexander Pushkin, Mikhail Sholokhov, Vasily Zhukovsky, Leo Tolstoy, Ivan Krylov, and many other celebrities of culture, science, and art visited Uralsk.

Enrolling in Training Courses at QMC during Holidays in Almaty Is a Great Opportunity for Busy Professionals!

PECB has established a unique network of partners, distributors, and trainers comprised of individual experts and organizations from all over the world.

As the situation with the COVID-19 pandemic continues to improve, travelers will have the opportunity to visit new places and countries and find a PECB partner in almost any destination where they go. In the ever-dynamic world of business, busy professionals do not waste a second. As such, PECB, through its extensive network of partners, trainers, and distributors provides the opportunity to the restless individuals wherever they are, even on holidays and trips, to enroll in a PECB training course and obtain credentials for various ISO standards. The Quality Management Center is proud to be part of the PECB network as an Authorized Gold Partner of PECB. Since 2002 QMC has been providing a wide range of training and consulting services in implementing various management systems based on ISO standards (quality management, occupational health and safety, environmental management, food safety, information security, anti-bribery, etc.).

QMC has translated 8 PECB training course materials and 12 exams into the Russian language, thus providing an opportunity to a Russian-speaking audience to learn the best international practices of various fields. When visiting Almaty, travelers can combine their business with leisure by enrolling in a PECB training course, passing the certification exam at the QMC. In the meantime, they can also get in touch with the special energy of ancient sacred places, hike local mountains, enjoy skating, or alpine skiing. QMC also has offices and offers services in the cities of Atyrau and Uralsk.

As 2022 is approaching, Quality Management Center wishes you a happy new year, filled with new and exciting opportunities! We wish that 2022 will bring you peace, health, and prosperity!

Some Facts About Kazakhstan

- Kazakhstan is located in the center of the Eurasian continent at the junction of two continents: Europe and Asia. The geographic center of the European-Asian subcontinent is located precisely in Kazakhstan.
- Kazakhstan is the homeland of nomadic tribes; in ancient times, Kazakhstan was a crossroad that connected India, China, and the Middle East.
- Kazakhstan stretches east of the Caspian Sea and the Volga plains to the mountainous Altai, from the foothills of the Tien Shan in the south and southeast, to the West Siberian lowland in the north.
- Kazakhstan is in the ninth place in the world in terms of physical area, i.e., it is one of the 10 largest countries in the world in terms of territory (only Russia, Canada, China, the USA, Brazil, Australia, India, and Argentina are larger). The length of its territory from west to east exceeds 3000 km, whereas from south to north is around 1700 km.
- With a population of nearly 19 million, the population density is one of the lowest in the world (fewer than 7 people per square kilometer).
- It is estimated that more than 130 ethnicities live in Kazakhstan.
- In 2020, Kazakhstan was ranked in 11^{th} place in terms of oil reserves.
- A man first flew into space in 1961 from the territory of Kazakhstan, from the Baikonur cosmodrome.

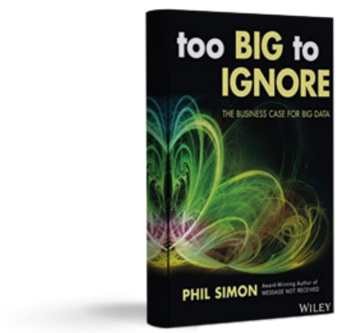
Ramilya Mustafina
Director of Quality Management Center

in

Ramilya Mustafina is the cofounder and director of the Quality Management Center (QMC), which was established in 2002 in Almaty, Kazakhstan. QMC provides training and consulting services on various ISO management system standards. Ramilya got her MBA degree in Strategic and General Management from the Maastricht School of Management (Netherlands). In addition, she is a certified management consultant (CMC), IRCA certified principal auditor for QMS, and holds various PECB Trainer's certification and PECB credentials for ISO 9001, ISO 21001, ISO 22301, ISO 31000, and ISO 37001. www.qmc.kz.

Big Data Book Selection

Big data is constantly being generated through our devices, affecting all of us. It is everywhere and it impacts everything. Access to this information, when in the right hands, can be used to help people, solve problems, and make the world a better place. However, if compromised and in the wrong hands, it can be easily misused to cause immense damage. To show how big data impacts our daily life, we have selected a list of books that offer insights and cautionary tips.

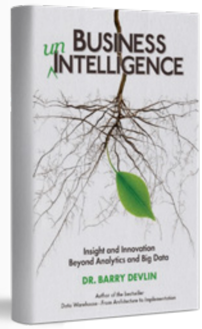


"Too Big to Ignore: The Business Case for Big Data" by Phil Simon

Too Big to Ignore: The Business Case for Big Data is the go-to big data book. With several case studies and opinions from worldwide big data experts, it is a must-read for anyone who is intrigued by big data and its use in business. The author inspects how every big industry and government uses big data to their advantage, allowing them to make observations and make predictions that people considered impossible. Readers will gain valuable insight on how to turn data into intelligence, and then, use that intelligence to determine the necessary future actions. It's time to think big.

This book explains why big data is important. The author provides great advice for people and organizations who want to gain an understanding and learn how to use the power of big data. Packed with case studies, examples, analysis, and input from big data experts, this is a great reading for business professionals, chief executives, company owners, and industry leaders.

<u>"Business unIntelligence: Insight and Innovation beyond Analytics and Big Data"</u> by Barry Devlin

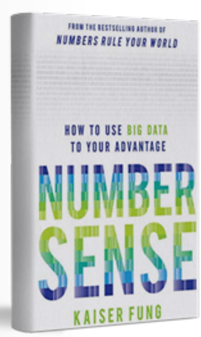


This book provides a unique point of view on big data and data analytics, by exploring the past, present, and future of this field, and disproving many misconceptions on data analytics and data gathering. It offers a look into the history of the field of business intelligence and equips readers with an insight on how to stay competitive within any given field, using big data to their advantage.

In our ever-changing world, business decisions must be based on a combination of rational and intuitive thinking and this book reflects that.

Combining cases and knowledge from different sources, provides decision-makers with an understanding on how they can practically innovate. This book provides a number of new models that can be used by business and IT to create support systems that will contribute to the organization's success.

<u>"Numbersense: How to Use Big Data to Your Advantage"</u> by Kaiser Fung



Kaiser Fung's "Numbersense" differs from a lot of books regarding this topic. Instead of teaching readers what big data is, it offers a critical look on the matter. With the immense amount of data that one can obtain, the book suggests filtering it to only obtain the insights needed.

To make better decisions one has to understand how analysis works. This book suggests readers learn and understand the methods being used for interpreting data and not to take data for granted. We are all responsible for the data we transmit, and it's up to us to question and verify.

<u>"The Data Revolution: Big Data, Open Data, Data Infrastructures and Their Consequences"</u> by Rob Kitchin

Recently, technological developments have certainly changed people's opinion on data and information. Nowadays, data is not a scarce commodity, but it rather flows wide, is low in cost, and is open and accessible to almost everyone.

It is a fact that a data revolution is in motion. This revolution is one that will reshape the world as we know it; it will change how we see knowledge, how we conduct business, and how we govern our society. With so many raising questions concerning surveillance, privacy, security, profiling, social sorting, and intellectual property rights, this book provides a synoptic and critical analysis of the emerging data landscape.

Big Data Analytics in Higher Education

BY DR. ARDIAN UKA, PECB UNIVERSITY

Data is an essential component of the daily operations of businesses. This includes data on customers' needs, which is usually collected to improve processes, products, or services. Big data comes in large volumes, from different sources, with different structures and types, and at high speeds. It is too large to be realistically analyzed by decision-makers on their own. This has pushed decision-makers into increasing their reliance on statistical analysis.

Big data analytics is also very important in higher education. It facilitates decision-making and improvement of individual and class performance under a competitive environment. Big data in education comes from two main sources: student information systems (including academic backgrounds, enrollment status, student performance, and demographics) and learning management systems (including 'LMS', 'blackboard canvas', and 'moodle' for information on students behavior).

The 6 Vs of big data analysis

The 6 Vs of big data analytics are six main concepts that define big data and the process of analyzing it. They are:

- **Volume**: the amount of data (e.g., card transactions, number of students using LMS)
- **Velocity**: the information flows (e.g., financial information, lectures, and exercises attended, notes delivered to students, notes accessed by students, regular conduct of student consultation, number of attending students, exam scores, feedback for students and lecturers on their performance).
- **Veracity**: the accuracy and trustworthiness of data, the storing process, and the relevance of data to the purpose it was collected Veracity also covers questions of trust and uncertainty.
- **Variety**: the division of data into structured, semi-structured, and unstructured
- **Verification**: data verification and security
- **Value**: determining the necessary activities and acting fast on any issues by students, lecturers, and other individuals or processes to generate value and benefits

The 6 Vs of big data analytics can be achieved through three stable pillars, which are as follows.

The three pillars of big data

The three pillars of big data are:

- **Data collection or accessing**: identifying the valuable, accurate, and relevant information from the big data collected, filtering it, and structuring it in terms of importance, type, etc.
- **Data analysis**: analyzing the data collected by first by defining the correlation and regression of variables and then diving into deeper further analysis, depending on the complexity of big data
- **Visualization and application**: the creation and presentation of the analyzed data as accessible and making it available for use to the users decision-makers

Big Data in higher education institutions: Types and purpose

The most common types of big data stored by higher education institutions include administrative data, department data, curriculum data, teaching and learning data, research data, and student data. Such data are usually collected in order to evaluate the future performance and challenges across academics, research, teaching, learning, outcomes, and growth of institutions.

There are three main categories of big data characteristic to higher education institutions:

- **Administrator**: an institution's academic programming, the allocation of financial and human resources by taking in the concern of the capacity building and supporting ongoing efforts
- **Students**: the main proactive feedback of student performance in class, exercises, and participation, learning pathway, and planning learning activities
- **Lecturers**: the lectures, continuous improvement of teaching, and instant feedback to students and administrators

The three stages of online big data analytics

Online big data goes through three stages:

i. **Micro stage** treats the clickstream data generated by students (interaction of an individual with the learning environment, including simulation, intelligent tutoring systems, previews of courses, videos, games, etc.). This stage allows understanding information of students' self-regulated learning in real-time. This is done by clustering all information and generating student personal profiles.

ii. **Mid-stage or text data** treats students' digital writing from discussion forums, online assignments, and social media interactions. This stage uses linguistics tools to determine student performance and student writing through cognitive (automatic student feedback and automated grading), social (online dialogue and discussion patterns, transcripts, videos, etc.), behavioral (course engagement, resource seeking), and effective (students self-concept or sentiment, motivation, and engaging in the learning activities e.g., their opinions on the course) methods.

iii. **Macro stage or institutional data** treats students' demographics (admission data, class schedules, enrollments, terms grades). This stage allows understanding information of students on a semester or yearly basis or even sending warnings (signs that students may be at risk of dropping a course or a program), course guidance, and an information system, which gives administrators information regarding the environment and the ability to understand students' behavior in the future regarding the completion of their degree, their eligibility to graduate, or the need of intervention.

Nevertheless, there can also be overlaps between the three stages, as the data collected covers the entire institution, not just students.

Challenges of online big data and analytics in higher education institutions can be approached through correlation and regression, as well as other statistical and analytical tools that enable accurate and useful information for decision-makers.

Therefore, big data analytics offers numerous benefits that are of great impact in resolving critical issues of the educational system.

OPINION

ISO/IEC 27002 New Version Highlights and Impacts on Compliance

BY AL MAHDI MIFDAL

As cybersecurity threats and attacks increase by leaps and bounds, the International Organization of Standardization (ISO) has developed and periodically updates information security frameworks to provide guidance on the implementation of controls to protect information assets.

ISO/IEC 27002:2013 Information technology — Security techniques — Code of practice for information security controls is one of them. It provides guidelines for organizational information security standards and information security management practices, including the selection, implementation, and management of controls, taking into consideration the organization's information security risk environments.

ISO/IEC 27002 is designed to be used by organizations that intend to:

- Select controls within the process of implementing an information security management system (ISMS) based on ISO/IEC 27001
- Implement commonly accepted information security controls
- Develop their own information security management guidelines

This article aims to provide an insight into the new updates of ISO/IEC 27002 Information security, cybersecurity and privacy protection — Information security controls. It also highlights the importance of a new requirement and presents its impact on organizations seeking to implement an ISMS against ISO/IEC 27001:2013.

ISO 27002: An introduction

The ISO 27000 family of ISO standards is closely tied to cybersecurity resilience. ISO/IEC 27001 is a central part of this family. Annex A of ISO/IEC 27001 presents various security controls to help meet the key requirements of the standard.

ISO/IEC 27002 provides guidelines on the implementation of controls of ISO/IEC 27001, Annex A. Unlike ISO/IEC 27001, organizations cannot be certified against ISO/IEC 27002.

Like all other ISO publications, ISO/IEC 27002 is reviewed periodically to remain up-to-date with its ever-changing industry. The new version is currently under development by the ISO Technical Committee: ISO/IEC JTC 1/SC 27 (Information security, cybersecurity, and privacy protection) and will soon be published in January 2022.

The expected changes

The newest version is expected to have an updated structure. It is expected to contain four chapters in contrast to 14 of the previous version. The chapters are as follows:

- People controls (8)
- Organizational controls (37)
- Technological controls (34)
- Physical controls (14)

The updated version is expected to have 93 controls, while its predecessor had 114. The majority of controls (61) remain unchanged. There are 11 new controls added, 3 have been deleted, and 48 have been consolidated.

The 93 controls are each tagged with the set of five 'attributes' below:

1. **Control type:** preventive, detective, and/or corrective
2. **Information security properties**: "Confidentiality," "Integrity," and/or "Availability"
3. **Cybersecurity concepts**: "Identify", "Protect", "Detect", "Respond", and "Recover"
4. **Operational capabilities**: governance, asset management, information protection human resource security, physical security, system and network security, application security, secure configuration, identity and access management, threat and vulnerability management, continuity, supplier relationships security, legal and compliance, information security event management, and information security assurance
5. **Security domains**: governance and ecosystem, protection, defense, and resilience

The following controls have been introduced in the new version of ISO/IEC 27002:

- Threat intelligence
- Information security for the use of cloud services
- ICT readiness for business continuity
- Physical security monitoring
- Information deletion
- Configuration management
- Secure coding
- Web filtering
- Monitoring services
- Data leakage prevention
- Data masking

New and important addition: Threat intelligence

The new version of ISO/IEC 27002 should be implemented to the fullest extent possible to mitigate known risks and avoid cybersecurity attacks. The new controls have been added by considering the newly emerging threat landscape. One update we think is really important is the changes regarding threat intelligence.

Threat intelligence is evidence-based knowledge, including context, mechanisms, indicators, implications, and action-oriented advice about an existing or emerging threat. It is contextual information that enables organizations to take proactive actions that can prevent, or at least mitigate, cyberattacks. It can be used to make informed decisions and responses to a threat.

Threat intelligence is about information; about potential attackers, their intents, motivations, and capabilities, and about possible Indicators of Compromise (IoC). This information can help cybersecurity professionals make faster, more informed security decisions and prepare for cyberattacks.

Threat intelligence is at pole position in the list of new controls. It provides information to security analysts regarding threats that have targeted or will target the organization. All information security experts agree that any data compromise can be devastating and must be avoided at all costs.

The updated version of ISO/IEC 27002 that will be published, will provide new guidance on threat intelligence controls and how their effective implementation and proper maintenance can help security leaders implement and maintain an effective ISMS based on ISO 27001.

This can be done through the preparation, identification, and prevention of cybersecurity threats that can compromise valuable corporate information assets and sensitive data, such as personally identifiable information (PII), protected health information/electronically protected health information (PHI/ePHI), card holder data (CHD), and any regulated, business, confidential/high-risk data.

Implementing a cyber threat intelligence tool can effectively address these issues and strengthen organizations' security postures by:

- Revealing the actors' intent and capability, as well as their tactics, motivations, techniques, and procedures (TTPs)
- Helping them understand the relevant actions that can be taken to neutralize them
- Revealing previously unknown threats and promoting proactive decision-making
- Integrating disparate bits of data to provide timely warnings and actionable information

All information security experts agree that any data compromise can be devastating and must be avoided at all costs.

For executive boards, C-level executives, and information security managers, implementing the relevant controls will help them understand cyber threats and make data-driven decisions to mitigate the impact of those risks based on the implementation of the threat intelligence lifecycle. There are different versions of intelligence cycles, but the goal is always the same: guide the cybersecurity team through the development and execution of an effective threat intelligence program.

Impact on compliance

An update to ISO/IEC 27002 will inevitably affect the set of controls in ISO/IEC 27001. It is therefore expected that these changes will be reflected in Annex A of ISO/IEC 27001 after the official publication of the updated ISO/IEC 27002 in Q1 2022. There is currently no impact on organizations that already maintain a certified ISMS based on ISO/IEC 27001. The requirement has never been that only ISO/IEC 27001 Annex A controls must be utilized – it only needs to be fulfilled, at a minimum, by demonstrating the implemented controls effectively align with the Annex A control objectives Any additional controls (PCI, HIPPA/HITRUST, SOC, etc.) deemed effective should be considered and applied to mitigate the identified risks.

In this case, the threat intelligence requirement will oblige organizations to plan and budget for a solution that can assist with the ongoing operational mitigation plans, unless they decide to outsource these processes to the third party. But with so many types of threat intelligence services and products available, finding the right one to meet their objectives can be challenging. Most importantly, organizations will have to demonstrate how they can scale their threat intelligence investment over time.

This can be very complicated when advantages and challenges of integrating threat intelligence with existing security solutions are not clearly understood.

The new requirements in ISO 27002 updated version will help drive some of these decisions, as threat intelligence helps organizations of all shapes and sizes process threat data to better understand their attackers, respond faster to incidents, and proactively be ahead of a threat actor's next move. This information helps smaller organizations achieve a level of protection that would otherwise be out of reach. On the other hand, organizations with large security teams can reduce the cost and required skills by leveraging external threat intelligence and make their analysts more effective.

Conclusion

The best way to gain the most value from the new version of ISO 27002, that is expected to be published is to use its controls to fulfill the requirements of ISO/IEC 27001 and gain certification. With an effective risk management approach and controls implementation, organizations can steer cybersecurity strategies by continuously monitoring and improving their ISMS to protect their assets, information and data. This will ultimately help organizations protect their reputation, retain customers, and increase profits!

Al Mahdi Mifdal
Principal – Privacy & International Assurance at Coalfire

Al Mahdi Mifdal is an information security subject matter expert, with over 13 years of senior information security compliance and consulting expertise for Fortune 500 companies, cloud service providers, Silicon Valley, startups and international companies in healthcare, technology, and critical infrastructure sectors. Al Mahdi has extensive experience managing a wide range of consulting projects (risk management, critical infrastructure protection, security operations center design, etc.), compliance assessments (PCI, SOC, ISO 27001, HIPAA, etc.). He currently serves as the PRIVACY & INTERNATIONAL ASSURANCE Principal at Coalfire Systems and manages ISO assurance services and programs for clients worldwide. Al Mahdi has earned several industry-recognized certifications, including the Certified ISO/IEC 27001 Master, CISM, CISA and PCI QSA.

ARTICLE BY ADVENTURESOFLILNICKI.COM

FOR FIRST-TIMERS TO

WAII

PECB advises you to avoid traveling nowadays due to the ongoing COVID-19 outbreak. However, make sure you add this incredible destination on your travel bucket list.

It's December and I know a lot of people are itching for a tropical escape to break up the long winter season in the northern hemisphere. With this 7 day Oahu itinerary you will be able to plan the perfect Hawaiian trip to help you beat the typical winter blues that set in around this time.

I've been to Oahu so many times over the years that I've lost count, seeing that I live in Alaska and am no stranger to hopping a last-minute cheap flight to our faraway neighbor to the south. Oahu is actually an easy destination with a well-connected public bus system and a very developed tourist infrastructure.

With that said, Oahu can feel over-touristic. But not to fear, this 7 day Oahu itinerary includes many off the beaten path destinations in Oahu in addition to well-known favorites to get a good mix.

Hawaii, in general, can also be quite expensive, however, there are budget-friendly ways to visit the most popular Hawaiian island, take it from me- the queen of cheap.

Getting around in Oahu

The two main ways to get around Oahu are by rental car and by public bus. Both have advantages and disadvantages, which I can attest to as I've used both to transport myself around Oahu.

Obviously, renting a car gives you the most freedom to move around as you wish in Oahu. It's also somewhat faster getting around than taking the bus.

I will state this, it's cheaper to rent a car from the Honolulu Airport than it is to rent a car in Honolulu proper or Waikiki. So if you plan to rent a car for the entirety of your trip, I recommend picking it upon arrival from the airport.

One downside to having a car while in Oahu is that most hotels in Honolulu and Waikiki (where you will most likely be staying) charge a daily rate for parking that typically costs $25-30 per day. You will want to factor this in addition to that screaming deal you got on a rental car from the airport, which makes things quickly add up. On occasion, you can find accommodation that offers free parking, though these typically aren't the norm.

If you don't need a rental car for every day you're in Oahu, I recommend renting a car for the days you need it from a car rental agency within walking distance of your accommodation in Honolulu or Waikiki. Pick it up in the morning and drop it back off in the evening, which

will allow you to skirt those pesky hotel parking fees. Shop rental car prices on Expedia, Skyscanner, and rentalcars.com.

TheBus

Oahu's public bus system is called TheBus. It has a surprisingly good network and can get you to many of the attractions around Oahu.

The island of Oahu has horrific traffic, due to the dense population. Home to nearly one million, you can imagine the roads of Oahu can be incredibly busy. One positive of using TheBus is that you can kick back and hang out if you get stuck in a traffic jam, rather than being behind the wheel yourself. The only disadvantage of using TheBus over renting a car is that it can take a bit longer to get where you're going as you will be making stops along the way.

The other advantage of using TheBus is that it's cheap. A one-way fare between two points anywhere in Oahu is only $2.75. You can also purchase a daily pass for unlimited use in a 24 hour period for only $5.50 per person.

For those that will be staying in Oahu for a longer period, you can purchase an unlimited month-long TheBus pass for $70.00 from 7-Eleven stores and Times Supermarkets around the island.

Where to stay in Oahu

A real budget-buster for visitors to Oahu are accommodation costs. Being one of the most sought-after destinations in the world, hotels in Hawaii can get fairly expensive especially during the high season months of December-February.

Not to fear, several hostels have opened their doors in Oahu, helping bring costs down for budget travelers, as well as companies like Airbnb that allow people to rent out their apartments, homes, and rooms.

Another trick to scoring on cheaper rooms is to visit in the off-season. Oahu is nowhere near as popular in the summer months, though July and August can bring in some families taking advantage of summer break from schools. I've found May and September to be my favorite months, as prices are cheap, and generally, most kids and college students are in school, which both help to reduce the crowds.

I recommend selecting a hotel in Waikiki for most first-time visitors to Oahu so that you're close to all the action in the evenings. For those wanting a quieter experience, head toward the north or east of Oahu.

Best accommodation in Waikiki

Budget: Polynesian Hostel Beach Club offers form beds, semi-private rooms (share a bathroom), and fully private rooms with ensuite bathrooms. Especially for solo travelers,

Polynesian Hostel is one of the cheapest options in Waikiki. Conveniently located near Kuhio Beach Park. Check the rates on booking.com and hostelworld.com.

Mid-range: VIVE Hotel Waikiki is the perfect middle-range option, located about 7 minutes walk away from Waikiki Beach and 5 minutes from the massive International Marketplace. Check the rates on booking.com and hotels.com.

Lux: The Royal Hawaiian is the historic pink hotel right on Waikiki Beach, a true landmark, constructed in 1927. My Grandmother used to tell me stories of her times in Hawaii in the 1960's staying in a hut-style bungalow right next to the Royal Hawaiian. Compare rates on booking.com and hotels.com.

7 Day Oahu Itinerary

Day 1: Relax on Waikiki Beach

You've probably earned it as Hawaii is geographically one of the most isolated places on Earth, located practically smack in the middle of the Pacific Ocean. What I'm getting at here is that many of you will likely have had a long travel day to get here unless you're coming from the North American west coast or Alaska with our convenient direct flights of about 5 hours.

Take today to dig your toes into the sands of Waikiki Beach, as the waves crash on the shore. My favorite place to head is Kuhio Beach as it's usually much more chill than other parts of uber-famous Waikiki. For a bit more action, another favorite stretch of mine is Duke Paoa Kahanamoku Beach, which is right in front of Fort DeRussy Beach Park.

Day 2: Central Oahu + Leeward Coast

The Leeward (west) coast of Oahu isn't exactly the most popular among tourists as very few visitors venture west of Central Oahu's Pearl Harbor.

Pearl Harbor

Of course, a visit to Pearl Harbor is a must for first-time visitors to Oahu, especially WWII Asiatic-Pacific Theatre buffs. Pearl Harbor is now a memorial to the 1941 attacks that formally entered the US into battle in World War II the following day. Following your visit to Pearl Harbor, take the remainder of your day to explore the Leeward Coast of Oahu.

Waianae Coast

If you're itching to take a hike, head to the beautiful Waianae Coast and stretch your legs on the Ka'ena Point trail to take in the lush verdant views of the coastal mountains and the Pacific blues lapping below. The hike is fairly easy, taking place on an old railroad bed. Depending on your fitness level it should take you 1-3 hours to complete the 6-mile hike, but don't feel obligated to do the entire thing, you can always just take on the first bit.

Another possible destination to visit is the Kaneana Cave, the remnants of an old lava tube and is a sacred site. This is not a maintained site so do take caution getting to the cave, and bring a flashlight if you plan to go inside.

Another option, if you will be visiting on a Saturday or Sunday is to take the 90 minutes Ewa Train that runs from Ewa to Kahe Beach Park.

This short train tour tells the stories of the Ewa Sugarcane Train, sugarcane plantations, and other historical points of interest along the way. A ticket for the train costs $15 per person.

Day 3: Oahu North Shore

The North Shore of Oahu is my second-favorite region of Oahu, so I recommend dedicating at least a day of your trip to it (though, if you have a longer trip, I would plan to spend a bit more time here).

If you're visiting in the months of December-February a cool experience is to watch big wave surfers take on the monstrous waves that pummel Oahu's North Shore.

Ehukai Pillbox

If you're keen for a hike, I'd recommend starting your North Shore day trip with a morning hike to Ehukai Pillbox.

The hike good way to get a taste of the North Shore's varied terrain, and from the top offers sweeping views of the Bonzi Pipeline below. Plan for it to take about 30 minutes to reach the top.

Hale'iwa

No visit to Oahu's North Shore would be complete without a visit to the historic surf town of Hale'iwa. A bit of a hub for Oahu's North Shore there are plenty of things to do in adorable Hale'iwa. I recommend grabbing an acai bowl over at Haleiwa Bowls, or some tacos at Killer Tacos, especially after the Ehukai Pillbox Hike.

Waimea Bay

Continuing along the Kamehameha Highway take the rest of your time to explore some of the favorites of Waimea Bay, including the famed Banzai Pipeline, and Sunset Beach. These beaches are known for their major surf, so take care getting in and out of the water here.

If you're moving a little faster-paced, or you have more time on the North Shore other points of interest include Turtle Bay, Kahana Bay, and the Dole Pineapple Plantation.

Day 4: Inland Oahu

Take a break today from the beaches of Oahu and use this day to explore Inland Oahu. There are heaps of things to do at the heart of Oahu.

Manoa Falls

One of my favorite spots to head in the earlier part of the day is Manoa Falls. The trailhead is pretty easy to reach, located about 15 minutes drive from Honolulu. Expect to need 1-2 hours to make the trek and enjoy the waterfall.

In all the hike is about 1.7 miles roundtrip and takes you through the verdant rainforest to Manoa Falls. Some rate the trail as difficult, but in my opinion, it was quite easy, the only dangers I noticed were some slippery areas of the trail due. The Manoa Falls trail was temporarily closed for maintenance but as of June 2021, it has officially reopened.

Pali Lookout

After Manoa Falls, head back down to Honolulu to get on the Pali Highway (HI-61) that cuts across the eastern part of Oahu from southwest to northeast.

There are several scenic pull-offs along this route, one of my favorites being the Pali Lookout from where you can continue on a hike along the Pali Notches Trail. If you're feeling adventurous, you could opt to take on the hike to Likeke Falls, the Maunawili Falls Trail, or the Piliwale Ridge Trail

Day 5: South Oahu

Diamond Head

Use today to explore the south coast of Oahu. I recommend getting an early start today and summiting near-to-Waikiki Diamond Head Crater for views in the best morning light and before it gets too warm. Set aside about 1-2 hours to complete the 1.8-mile hike.

Hanauma Bay

Next, it's off to Hanauma Bay to get up close with the reef and the aquatic wildlife that inhabit the area. Hanauma Bay is a gorgeous bay located on the south coast of Oahu near Koko Head. From the parking lot, you will get to enjoy a spectacular walk to the bay from which you can snorkel and get to know the reef a bit better.

You do need to watch a video before entering the park and pay a $25 fee per person (for non-residents) and there are snorkels available for rent. There's also a $3 parking fee for non-residents (if self-driving).

Makapu'u

After you've gotten a taste of what underwater Oahu has to offer, it's time to head further east across the south coast to Makapu'u. Makapu'u is home to a lighthouse with a paved walking path that heads up to a lookout that gives arguably some of the best views over the island, including a panorama over the south coast and the Windward Coast (this is my favorite viewpoint of Oahu!). The walk is about 2.5 miles roundtrip and don't forget to bring water as it can get quite warm in the afternoon.

From the Makapu'u Lighthouse Trail, you can take a turn off the paved path to access the Makapu'u Tide Pools below. This is one of the coolest spots on the island, and honestly, if you skip Diamond Head in the morning, I thoroughly recommend heading to the Makapu'u Tidepools instead for the best sunrise spot in Oahu.

Do be careful as things can get dangerous at the tide pools, and check the weather before you go as large swells can turn a visit to the tide pools into a deadly one.

Alan Davis & Pele's Chair

Finally, spend your last bit of today at Alan Davis Beach and Pele's Chair. This is a bit off the beaten path, but worth the trek to get out there. Make sure to bring plenty of water with you.

You can access Alan Davis from the Makapu'u Lighthouse parking lot, but instead of following the paved path up, you will follow the sandy Kaiwi Shoreline Trail to reach Pele's Chair and Alan Davis Beach (you can't miss Pele's Chair, trust me). The Kaiwi Shoreline Trail also continues westward from Alan Davis to Sandy Dunes Beach, so you can optionally start the hike from there too.

Day 6: Windward Oahu

Saving the best for last, we're finally onto my absolute favorite part of Oahu, the Windward Coast, in my opinion, home to the best beaches Oahu has to offer.

Waimanalo Bay

Get an early start and head toward my favorite part of Oahu, the Windward Coast. First on the agenda, Waimanalo Bay. Waimanalo Bay is home to beautiful powdery white sands and crystal clear water. Make sure to take a stroll along the beach, taking in the gorgeous sceneries of the mountains in the distance, the ocean, and Rabbit Island out there in the bay.

Kailua & Lanikai

Next, head toward my favorite kick-off spot on Oahu's Windward Coast, Kailua. This is where you will find gorgeous white sandy beaches and perfect turquoise waters. Take some time to truly enjoy Kailua (honestly don't feel bad if you don't even move elsewhere throughout the day, trust me, it's that good). Make sure and take a long stroll down the beach from Kailua to check out Lanikai Beach as well. If you're looking to get in a hike here, I definitely recommend the Lanikai Pillbox Trail as the views are absolutely insane from the top.

Kualoa Ranch & Beach Park

If you find a way to peel yourself from Kailua and Lanikai (no judgment if you don't), continue up the Leeward Coast. Continue onto Kualoa Ranch and Beach Park to see the famous mountains that you will probably recognize from the Jurassic Park films from the 1990s.

You can spend a decent afternoon hanging out at Kualoa Beach Park, which I typically find to be pretty chill, though if you're short on a time a quick visit is easy to execute. You will have perfect views over to Mokoli'i Island right offshore. If you're wanting to pick up a delicious souvenir to take home with you, you can head down the road to the Macadamia Nut Farm to sample different flavors on offer and pick up a bag (or 5).

Crouching Lion

Finally, continue onto Crouching Lion if you have the time. It's another great stop if you're up for a trek is Crouching Lion that offers sweeping views over Kahana Bay. Crouching Lion Hike is short and sweet at under 0.5 miles round trip, but it is steep, and finding the access point can be a bit tricky, but the views are well worth the hassle.

If you opt to do today in reverse, heading to Crouching Island in the morning at sunrise is a good way to start your day for perfect lighting as you summit. Alternatively, sunset is nice up here too.

Day 7: Waikiki & Depart Home

Since this is the final day of your 7 day Oahu itinerary, I recommend spending it close to your accommodation, getting the last dose of vitamin D before you have to bid the Hawaiian Islands aloha to depart home. If you need to do any shopping or last-minute souvenir purchases you can do that today as well. Though, if you do have the itch to go anywhere today, I recommend re-visiting any Oahu favorites (I tend to spend my last day on Oahu in the Kailua-Lanikai area myself).

Best Restaurants in Waikiki

Ramen Nakamura: Ramen Nakamura is what got me hooked on ramen years ago. I was in Honolulu for a wedding and two friends drug me in and I can't visit Oahu without eating here since then. It's tiny, so if there's a line out the door don't be surprised (and also it's well worth the wait).

Musubi Cafe Iyasume: If you're visiting Hawaii, you must try musubi- the Hawaiian spin on Japanese sushi. It can be topped with several different types of meat and whatnot, though traditionally the topper is grilled spam (don't turn up your nose! Spam isn't the healthiest but being a kid from Alaska I love a good piece of fried or grilled spam. Musubi Cafe Iyasume is renowned for serving up some of the best, though if you're looking to grab some on the fly you usually can pick it up at any mom-and-pop shop.

Orchids: If you have a Sunday morning in Oahu, the Orchid Sunday Brunch is to die for. Orchids is a gorgeous ocean-front restaurant that serves up high-end fare, so plan for an expensive bill.

Roy's Restaurant: Chef Roy Yamaguchi, who is largely credited for creating Hawaiian-fusion cuisine, blending French techniques with Pacific-Rim flavors. He has several restaurants in Hawaii now, but I recommend stopping into Roy's in Waikiki.

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PECB WISHES YOU HAPPY HOLIDAYS!

As we leave another year of hardship behind, let's enter the New Year with a high standard of hope, positivity and, prosperity.

We wish you a blessed new year!