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Accelerate Your Business with Real-Time Insights

A note from Trevor Curwin, Editor-in-Chief, RTInsights

Building a community around the world of real time is a challenge today, but for the best of reasons: growth has been astronomical as more enterprises realize their business lines have real-time potential, and existing real-time use cases expand and strengthen.

That means a lot of prospective new clients for the players in this space. And that opportunity requires education. For us, we look to bring thought leadership from our own experts and from those elsewhere in industry to help educate a wider pool of decision-makers and innovators in the areas of IoT, AI, machine learning, blockchain, analytics and big data overall.

To that end, we created the RTInsights Brain Trust—a circle of evangelists, big thinkers, and passionate leaders who we bring together to help shape the world of real-time, data-driven, actionable insights.

Think of it as the best conference panel you could imagine, a discussion with real takeaways that our enterprise audience—often your customers as well—can use to plot their digital transformation journey.

You can see some of their curated work here, and if you want to know more check out https://www.rtinsights.com/the-rtinsights-brain-trust/

DATA & ANALYTICS

Data-as-a-Service: The New Model for Analytics?

By Kelly Stirman, RTInsights Brain Trust Member and VP of Strategy, Dremio

Modern IT organizations face an impossible challenge: the ratio of data consumers—BI users, data scientists, analysts, decision-makers—to capable data engineers is 100:1.

As a result, data consumers wait in line for their turn with IT, hopeless without a data engineer to provision data for their particular needs. As a result, data consumers are under-utilized, and companies aren't moving as quickly to the next insight as they would like to be.

Why does this happen? Today organizations have data stored in hundreds or thousands of silos, across a mix of technologies and formats. In addition, data consumers rely on a number of different tools to do their jobs effectively, including multiple BI tools, Python, R, SAS, Excel, and others. IT is left in the middle, fulfilling requests to source data from multiple systems, and provision it in a way that works for a given tool and group of users. Each day is a race to put out the next fire.

Data-as-a-Service has been introduced to simplify these challenges by allowing companies to leave data where it is already managed, and to provide fast access for the data consumer regardless of the tool they use. By building on open source standards and new paradigms for in-memory computing, Data-as-a-Service helps IT organizations to empower data consumers to be more independent and self-sufficient while making the data engineer more productive.

Data Lake or Data Swamp?

Data lakes are an agile, low-cost way for companies to store their data, but without the right tools, the data lake can grow stagnant and become a data swamp. Often, data lakes suffer or fail when there is no way to govern the data, no easy way for data consumers to access the data, and no clear goal for what it is supposed to achieve.

Over the past decade, companies have worked to deploy data lakes into their technology stacks in order to solve the great challenge of too many silos of data. While data lakes made it easy to store the data "as is," they leave the challenges of data quality, security, performance, and accessibility to software engineers to solve on a project by project basis. While data lakes simplify where to find the data, they don't help with how to access the data for data consumers.

The Workaround

To improve access for data consumers, many organizations turn to the tried and true relational database. They move the data from the data lake into one or more data warehouses or data marts and spend enormous time and effort to create ETL scripts that transform the data from the lake in order to ensure quality and integrity of the data before loading it into the database.

As a result, companies find themselves struggling with the same problems that drove them to consider the data lake in the first place: data warehouses are expensive and complex to operate; data warehouses are challenging to scale; the lead time to make the data available is too long. And finally, with this approach companies end up with yet another silo to manage, secure, and govern, the very problem they were trying to solve in the first place!

A New Paradigm: Data-as-a-Service

Recently a new approach has emerged that provides a fundamentally different way to approach the problem. With advances in hardware and in-memory computing, software engineers are now able to tackle this old problem in a novel way.

First, Data-as-a-Service recognizes that organizations will never finish the job of consolidating all their data into a single system. Instead, Data-as-a-Service assumes data will exist in many different systems and formats, and it queries the data in situ. Instead of moving the data into a new silo, Data-as-a-Service solutions connect to the underlying databases, file systems, and object stores and query the data directly.

Second, Data-as-a-Service is designed for data consumers. Instead of placing the burden entirely on IT, Data-as-a-Service provides a self-service experience for data consumers to easily search and discover datasets using a searchable data catalog; to easily preview data in order to verify its applicability to the task at hand; to curate new datasets by filtering, transforming, and joining different datasets together, without writing any code; to share their work with other individuals or teams, so people can build on the efforts of others; and to continue to use their favorite BI and data science tools, but more productively.

Third, Data-as-a-Service recognizes that it is essential to separate the logical and physical aspects of data. Data consumers should be able to name, describe, and categorize datasets on their own terms, independent of how the physical data is managed. In addition, optimizing the access to the physical data should be independent of the logical model used for organizing and accessing the data. To these ends, Data-as-a-Service provides the ability to accelerate and scale access to the data using modern columnar in-memory data structures and scale-out architecture, without being coupled to the limitations of a given physical source.

Fourth, Data-as-a-Service must address the security and governance goals of an organization, ensuring that users are only able to access the appropriate data they are entitled to access. Data-as-a-Service must provide fine-grained controls, including row and column-level access controls and masking of sensitive data, even when the underlying source does not provide these abilities.

Fifth, finally, Data-as-a-Service must be open source in order to remove vendor lock-in and to ensure the contributions of a broader community can be made to benefit all users. Data-as-a-Service is deployed in a critical piece of the data technology stack, and as a critical component must be open source so that any company can benefit.

Conclusion

Ten years into the AWS era, companies love the “as-a-service” model. Infrastructure was once a multi-month lead time for new applications but now is available with the click of a button. Tools and applications have followed suit, and the idea of waiting weeks or months for IT to install and provision for a new technology seems antiquated.

Yet when it comes to data, companies today still follow the equivalent of “racking and stacking” in order to provision a new dataset. Data-as-a-Service opens the door to making data more like the services used for provisioning infrastructure, tools, and applications.

INNOVATION

6Q4: TCS' Seeta Hariharan, on Going Real-Time and Wrangling Innovation

By Trevor Curwin, Editor-in-Chief, RTInsights

Tata Consultancy Services' head of their digital software & solutions group talks about how real "real-time" is in your digital transformation journey.

Our "6Q4" series features six questions for the leaders, innovators, and operators in the real-time analytics arena who are leveraging big data to transform business as we know it.

Q1. In the race to connect with customers and faced with so many data gathering/analysis/decision options, what are the top questions your clients ask when beginning to use this digital intelligence?

They usually ask several questions:

- *How do I balance the requirements across the various stakeholders within my enterprise and determine the right priorities for the organization?* For example, when you talk to chief operating officers, they want to drive efficiencies in operations. When you talk to someone in marketing, their priority is to get enough intelligence to drive targeted campaigns. And chief customer officers want to equip front-end personnel with precisely the right customer information.

- *When can I see the return on investment?* Digital transformation initiatives require significant investments. To gain confidence, many enterprises start small so they can build confidence before investing in broad-based initiatives.

- *Can you help future-proof our digital strategy?*

- *As a global organization, what are the IT architecture implications when designing for GDPR or other privacy laws such as the one in California going into effect by 2020?*

Q2. Smart cities are part of your focus, too. What special challenges do you see in bridging that private/public gap in needs, between your IUX (Intelligent Urban Exchange) and CI&I (Customer Intelligence & Insights) software products, for example?

If we look at the two domains, CI&I enables enterprises to keep customers at the center of everything they do and IUX allows cities to keep citizens at the center of urban initiatives. Both of them work to deliver superior experiences to their constituents. Given the synergy, we built our portfolios on a common platform called the Connected Intelligence Platform.

Why did we choose these two portfolios? People transact with businesses in the context of where they live – such as a city. Collaboration between enterprises and cities will become more and more important as enterprises develop new ways to interact with their customers, citizens, and visitors in real time. Consider the notion of *city commerce*. When there's a football game in the city, retailers close to the

venue may want to take advantage of the event by attracting fans to their stores through targeted offers. This would boost revenues for local merchants and increase tax revenues for cities. When it comes to smart cities, while it's important to focus on traditional urban domains such as parking, transportation, and lighting, city commerce is a promising but untapped opportunity. This is where we see an intersection between our two portfolios.

Q3. For consumer-focused clients looking for better engagement, they're usually building on some kind of client relationship platform (an app, a social media presence, a loyalty program) that may be somewhat static. How do they get ready for "real-time?"

Seeta Hariharan,
GM & Group Head, TCS Digital Software & Solutions Group

There are three basic steps needed to get ready for taking advantage of real-time data.

Enterprises must first agree on what real-time means, what data they need in real time, and what data sources they should use.

Once they've nailed the meaning of real-time and clearly formulated the requirements for real-time analytics, the next step is to formulate the supporting architecture. It will need the ability to process data at very high speed (depending on the data source it can vary from milliseconds to minutes). The architecture must also be able to deal with spikes in data volume and scale up as data grows.

> **"Digital transformation initiatives require significant investments. To gain confidence, many enterprises start small so they can build confidence before investing in broad-based initiatives."**
>
> – Seeta Hariharan, TCS

The third step is to align internal processes. There is a reason why enterprises are implementing real-time analytics. Perhaps they aren't satisfied with how their internal processes are running. Let's say you're a manufacturer suffering from lengthy equipment repair times. Breakdowns are always unexpected, but your maintenance team often spends hours identifying the problem, only to discover they don't have the replacement part to fix the machine.

Using real-time analytics, the requirements for the maintenance team's operation will definitely change. The enterprise will expect faster fixes as well as preventive maintenance based on the data gathered. To make the most of the analytics solution, an enterprise should revise existing maintenance processes, key performance indicators, and job descriptions.

To read the conclusion of this interview, visit our website.

ARTIFICIAL INTELLIGENCE

5 Predictions on RPA and Business Line AI Use Cases

By Tom Wilde, RTInsights Brain Trust Member, and CEO and founder, Indico

Take a look at our **predictions on how 2019 could be the year that AI finds real business use cases.**

#1: AI/Data Science Meets the Line of Business

One of AI's biggest obstacles has been the disconnect between data science teams and subject matter experts (SMEs) in the business. SMEs play a critical role but the complexity of the underlying tech typically requires a lot of data science expertise. Enterprises will put increasing pressure on their teams to close this gap so that they can get more value from their AI initiatives.

#2: The Rise of Explainable AI

As AI becomes embedded in more and more processes, there is an increasing need for transparency in how it works and makes decisions on our behalf. Users will demand real-world, plain English examples and explanations to for full transparency. This will also make it easier for data science and SMEs to collaborate on improving AI's contribution to the business.

#3: More Focus on Mid- and Back Office Applications/Use Cases

A lot of the attention in AI to date has been on the front office applications – those involving customer service interactions via bots. As companies look for ways to drive more profitable growth, they are looking at more opportunities to use AI and machine learning in their back-office operations – especially those manual, document-based workflows that drive many of their core business processes.

#4: AI is No Longer "What." It's "How."

Companies are looking for business solutions – aimed at improving the customer experience, accelerating cycle time, increasing business efficiency, and expanding capacity and productivity. Expect to see fewer AI-only solutions coming to market, and fewer pure-AI startups being funded.

#5: Filling the Gap Between RPA and AI (IPA)

RPA has been one of the hottest areas of tech in the last two years – because of its simple, easy-to-understand value prop – process automation, efficiency; freeing resources up to focus on higher value activities, etc. But It has fundamental limits – it's only effective with rote, repetitive processes and it cannot impact workflows involving unstructured content which makes up over 80% of data in most enterprises.

At the same time, AI and machine learning are seen as too esoteric; requiring too much data science expertise, too much hand-holding, too much uncertainty and risk about ROI. Companies will look to bridge the gap in 2019 – between the horsepower of RPA and the intellect of AI/machine learning through what many experts are calling "intelligent process automation," or IPA.

Help us expand the discussion and build out the future of real-time by joining the RTInsights Brain Trust.

BLOCKCHAIN

Case Study: Blockchain Takes a Spin Around the Real-Estate Block

By Joe McKendrick, Contributor and RTInsights Expert

Blockchain technology is now helping one South American city with its real estate registry and the tracking of ownership.

Name of organization: Municipality of Pelotas, Rio Grande do Sol, Brazil

Industry: Government

Location: Pelotas, Rio Grande do Sol, Brazil

Opportunity or Challenge Encountered: Brazil lacks an integrated system of land management, with administration fragmented across different government levels. Registering a property in the country involves 13 separate steps. The survey database and registration databases kept by real estate registry offices "are not integrated and different identifiers are used for the same piece of land, creating uncertainty around identification of the property," according to a recent case study carried out by researchers at the University of British Columbia, conducted in cooperation with the Real Estate Registry Office – Pelotas – RS, Brazil, Ubitquity LLC, the National Archives of Brazil, and CNPq UFSM Ged/A Research Group. "There is also no electronic database for checking encumbrances (liens, mortgages, restrictions, etc.)." This opens up registration processes to bribery and other forms of abuse.

To modernize and streamline the real-estate registration process, Brazil recently introduced the SRE – Electronic Property Registry System project. This included the establishment of a National Registry Operator, responsible for coordinating property registration between previously isolated property registration offices and to define the architecture and operating model for an Electronic Property Registry System. The challenge is to carry out this effort cost-effectively, using the latest technology.

How This Opportunity or Challenge was Met: In April 2017, Ubitquity announced a pilot project in partnership with the real estate registry office in the State of Rio Grande do Sul, Municipalities of Pelotas and Morro Redondo. "The goal of the project was to create a pilot program for the region's official land records in an effort to help lower costs while improving accuracy, security, and transparency of land records," the researchers state. The pilot is a parallel platform to replicate the existing legal structure of property ownership and transferring recording within the cities.

The solution uses Ubiquity Platform Blockchain version 1.1, Colu's API (alpha). Ubitquity's solution through the cloud, for recording land transactions via a web front end. Blockchain technology is being used to ensure the authenticity of information related to real estate property, "to affirm for sure that a particular property belongs to a particular person," the case study relates. The Pelotas pilot involved only a half dozen records, to test security and cost structure.

Information for the blockchain is exported from a real estate registry, which contains data including registration number for the property, the name of the owner, the address of the property, as well as the image of the property, photos of books, and the certificate. Images of the property, as well as PDFs of deeds and other documents relating to the property, are stored in Ubiquity's cloud service. These components communicate with the Colu API, translating entered data into a format that permits assets (i.e., land) and transactions involving those assets (i.e., land transfers) to be recorded on a blockchain.

Benefits of this Initiative: "The blockchain allows ownership and title disputes to be handled in a fair and transparent fashion, and serves as a backup in case the original is destroyed or misplaced," according to Nathan Wosnack, President/CEO of Ubitquity, stated. "Longer term, the project anticipates creating a system that incorporates the features of blockchain technology to transform the existing recording and property transfer processes."

VIRTUAL/AUGMENTED REALITY

Virtual Reality, Augmented Reality, and Getting Business Done

By Alexander Soley, Contributor and RTInsights Expert

Virtual reality and augmented reality are growing dramatically as entertainment. But they'll open much bigger opportunities in business.

Over the last few years, there has been a shift in attitude regarding virtual reality (VR) and augmented reality (AR) technologies. In the past, they were generally seen as either science fiction concepts that could never be real or as technology restricted to the world of video games. Nowadays, there is an increasing understanding that they have a practical use beyond storytelling and games. Businesses ranging from health to oil and gas are integrating VR and AR into their work processes.

"Virtual Reality" or VR for short allows the user to view a reality that exists digitally but not physically. The illusion is achieved by wearing a VR "helmet" that projects images and sounds to give the illusion of an alternate reality. Video game companies use this technology to improve consumers' suspension of disbelief. A gamer can become a soldier, a stuntman, or a surgeon. The technology that allows gamers to enter different worlds is being extended to the real world.

VR games rely on specialized helmets which rely on technologies often independent of the games. There was excitement after the Oculus Rift VR helmet was kickstarted a few years ago because video game companies thought the quality of the tech and games would lead to high consumer sales, but apart from the Playstation VR *(which is designed to be used with the Playstation 4)*, most of the VR headsets have been relatively slow in sales. This is especially true of the smartphone-based VR headsets, which are much cheaper than their heavier brethren but lack applications and mindshare. Although the sale of helmets to consumers has been disappointing, the business world sees great promise in them.

AR by contrast does not create an "alternate" reality but uses a display to augment and overlay information and/or images on the world. AR does not rely on the user wearing a special device to see an illusion. The best known AR-based video game is *Pokemon Go*, a mobile phone game where people wander around a neighborhood, find monsters to catch, and then use a digital ball to capture the monster that is overlaid on the world right in front of them. In contrast to VR, AR has not been as exploited by entertainment companies as VR. In fact, corporations and the military have been quicker to see its potential in the workforce. For instance, in the early 1980s, the video game company Atari was tasked by the U.S. military to adapt its VR tank simulator arcade game Battlezone for military use.

Safety will be one application

These technologies lend themselves well to improving people's safety. For example, AR technology keeps workers safe by recognizing when a tool is being misused and projecting instructions for proper tool handling from a user's point of view. Cars may in the future recognize incoming dangerous obstacles by sending information to the driver via projections and graphics that are highlighted on the obstacle on the windshield. Physicians can use AR technology to be alerted to issues during surgeries.

One of the ways companies are taking advantage of VR and AR tech is by using them for communication. Instead of having people use a computer or a phone to communicate, one can create a virtual environment where people can create avatars to talk to each other. Facebook already has an offering called "Spaces"

where users can give avatars facial expressions to facilitate conversation and to make the conversation more real. Video game companies are experimenting with the idea of having players virtually play alongside each other, even when players are strangers and are not physically in the same spot.

One such game is Rec Room, which allows its players to take part in a wide range of activities in a virtual environment. Companies are using this technology to facilitate conferences and meetings. VR allows people in different locations to work on a common product or project. For example, Virtalis advertises that their VR technology allows people in different locations to join virtual rooms where they can observe, manipulate, and edit objects virtually to collaborate on projects. This way, teams can work jointly on projects and see the changes in 3D in real-time. This same technology can be useful to doctors who need to treat patients remotely or who want to collaborate on the development of medical equipment.

Companies see potential in using VR and AR as a way to preview what a project or location will look like once construction is complete. The architecture company AECOM uses the Microsoft HoloLens to add 3D images of buildings on top of maps to get a better understanding of the layout of large projects. Their code allows people to see projected construction over time plus the environmental and social conditions that will surround the project.

Kalloc Studios developed the software known as Fuzor to create virtual locations so potential investors can preview the locations before they pay the construction companies to start work on the new buildings. There are many other applications that one can imagine for this type of technology. For example, VR may allow a customer to walk into a retail furniture store with a virtual model of the type of room they want to furnish and see how the furniture works in that environment.

VR technologies are not limited to building virtual worlds and diagnosing problems; they can also be used to track one's recovery and treat people. For example, VRHealth is using VR games to help those with health problems assess their physical health by playing games as a form of treatment. These "games" can assess patients' health and problems through physical challenges. Such diagnostics can be used to track a patient's health. VR can also be used to train doctors in surgical procedures and practice new technologies without putting a patient at risk.

VR is also being utilized to treat mental health problems such as paranoia and post-traumatic stress disorder (PTSD). Virtually Better sells VR software to treat people with phobias, addictions, and PTSD and provides VR training to health providers. There are firms that use VR to treat chronic pain and dementia. VR and AR are playing a role in treating diseases, and they will help create the next generation of doctors as well.

VR technology is useful for training purposes since they can train many people in different locations at the same time. Shafi Ahmed, the co-founder of Virtual Medics and Medical Realities, used VR to live-stream a cancer surgery in 360 degrees to many doctors at once. This allowed doctors to see exactly what the surgeon was seeing and have the opportunity to look around the room.

VR technology can revolutionize how factory workers are trained. For example, new hires could be given a VR helmet on their first day to receive instructions and virtual practice before performing tasks. This allows people to practice in a controlled environment before working on the factory floor. AR goggles can introduce advanced methods as the worker gets more experienced and overlays instructions and reminders when they are needed.

To read the conclusion of this article, visit our website.

IoT

Digital Experiments Will Supercharge IoT Innovation

By Joe Speed, RTInsights Brain Trust Member and Field CTO, Iot Solutions, ADLINK

The Internet of Things may spawn a thousand new ideas, but this requires a thousand trials to see what works. Typically, the resources for testing and piloting have been precious and few. Digital experimentation may make this process cheap and fast.

The intelligent connectivity offered through the Internet of Things and edge computing opens up vast opportunities for businesses. Edge analytics, machine learning, computer vision, and other emerging trends will lead to new product development, enhanced relations with customers, and faster time to market.

However, conceptualizing these innovations and turning them a reality are separate things. New ideas or processes, as they have always been, need to be tested and validated as of value to the business. Most organizations cannot commit enough time and resources to experiment and test new approaches. Employees may generate 100 new ideas a day; but the organization may only have enough resources to pursue one of those ideas if it's lucky.

With the Internet of Things and intelligence at the edge, the challenge becomes even more daunting. IoT and edge computing are based on complicated combinations of hardware, software and network stacks, many of which may be out of the reach and purview of the organization.

A study released by Cisco finds that despite the forward momentum for IoT, 60 percent of IoT initiatives stall at the proof of concept stage and only 26 percent of companies have had an IoT initiative that they considered a complete success.

Without experimentation, innovation grinds to a slow crawl – if not a complete halt. Innovation is critical to companies seeking to develop and bring their services, processes and platforms to customers, partners and employees. Until recently, testing and trying out new ideas and process used to incur more costs than it was worth. But digital technologies – such as online A/B testing, rapid prototyping, and computer simulation – enable experiments to be conducted rapidly and cost-effectively.

To succeed long term in the digital economy, companies need to "evolve their strategies by experimenting with small offerings and learning what their customers value," writes Jeanne Ross in *MIT Sloan Management Review*. "Eventually, big companies will become successful digital companies because they know how to scale successful experiments."

A comprehensive effort to conduct regular and frequent experiments should be part of any digitally driven company. "By combining the power of software with the scientific rigor of controlled experiments, your company can create a learning lab," write Ron Kohavi of Microsoft and Stefan Thomke of Harvard University in *Harvard Business Review*. "The returns you reap – in cost savings, new revenue, and improved user experience – can be huge. If you want to gain a competitive advantage, your firm should build an experimentation capability and master the science of conducting online tests."

There are many innovations that can be delivered via digital experimentation with IoT. They may be of high-level strategic value, such as introducing a value-added monitoring service for products installed at customer sites. Or, they may provide operational advantage, such as enabling enterprise administrators to link sensors measuring and monitoring temperatures, pressure and vibrations on production machinery to control systems.

As digital experimentation is so inexpensive, it is helping to clear out all the organizational inertia that typically throws sludge into the innovation process – resulting in paralysis by analysis.

As digital experimentation is so inexpensive, it is helping to clear out all the organizational inertia that typically throws sludge into the innovation process – resulting in paralysis by analysis. Often, big organizations spend more time, energy and money debating an idea than it would take to actually try it out. Many companies, in fact, have spent years and millions of dollars in the process of innovation, mainly because experimentation was so expensive.

With digital experimentation, trying out new ideas or concepts becomes quick and easy. Enterprises can try many ideas. It's important to remember that not every idea – even ones that sound good on the surface – is a money maker. Not every idea is going to improve your operation. Not every idea saves lives. But if you can lower the effort to cost, the investment, and you can do many of them, you're more likely to discover some really great things that do great for your business.

Digital experiments provide the following advantages:

- They bring IT and operational technology together. Digital experiments align technology resources and apply them to business opportunities and problems.
- They strengthen management's confidence for investing in IoT initiatives. The results of digital experiments help demonstrate the value delivered from various IoT efforts.
- Unsuccessful experiments are just as valuable. Potential waste of organizational resources is avoided.
- They bring together complicated scenarios. There are many moving parts to an IoT network, supporting multiple standards, multiple technologies, multiple data types, and multiple vendors. Most testing and experimentation environments are designed to support a single-vendor environment.
- They help companies get more value out of technology investments. Devices and online services may be sitting, underutilized.

"[Some] organizations have discovered that an 'experiment with everything' approach has surprisingly large payoffs," said Kohavi and Thomke in *Harvard Business Review.* "At a time when the web is vital to almost all businesses, rigorous online experiments should be the standard operating procedure. If a company develops the software infrastructure and organizational skills to conduct them, it will be able to assess not only ideas for websites but also potential business models, strategies, products, services, and marketing campaigns – all relatively inexpensively. Controlled experiments can transform decision making into a scientific, evidence-driven process – rather than an intuitive reaction."