“Exploring the unknown requires tolerating uncertainty.”

- Brian Greene
“If your actions inspire others to dream more, learn more, do more and become more, you are a leader.”
- John Quincy
07  POTENTIAL SHIFTS IN THE WORLD, #COVID-19

Saji Rajasekaran writes about the silver lining in the very dark cloud that has cast over our world. – “Apart from the tremendous number of lives lost and the huge impact on several industries and jobs, COVID-19 has caused a lot of pain and distress.”

08  THE CRUCIAL COMPONENT OF DATA-DRIVEN ORGANIZATIONS

Sankul Seth discusses the most important aspect of being a successful data-driven organization. – “Understanding of data is the first stepping stone for any organization to be data-driven.”

11  KEEP CALM AND BE A GREAT LEADER IN A TIME OF PANDEMIC

Katy Sherman shares her advice to leaders to tide through tough times. – “While virtual teams are not unusual, today’s situation brings its own challenges.”

13  DISCOVER, MONITOR, ANALYZE & PREDICT COVID-19

Bargunan Somasundaram explores how Big Data and AI can help us go from insights to action. an imperative in times like these. – “One of AI’s core strengths when working on identifying and limiting the effects of virus outbreaks is its incredibly insistent nature.”
IN THIS ISSUE

16 PREDICTION FOR BUSINESS SERVICE ASSURANCE

Vasudevan Gopalan writes about how the bringing in the component of incident prediction can help enterprises keep their lights on always.

“Predictions are done at multiple levels – application level, business process level, device level etc.”

19 MACHINE LEARNING FROM PROGRAMMER’S PERSPECTIVE

Gireesh Sreedhar KP breaks down Machine Learning for us.

“Data-driven decisions increasingly make the difference between keeping up with the competition or falling further behind.”

21 DASHBOARD SAP LUMIRA DESIGNER – WRITE BACK FUNCTIONALITY

Mohammed Fazal Uddin Kashif delves into the useful write back functionality of SAP Lumira Designer.

“Write back functionality assists business users to modify the data while analyzing from the dashboard rather than doing it in the source system.”

24 SMART SPACES TECH TRENDS FOR 2020

Priyanka Pandey takes us through the 5 Smart Spaces tech trends that holds the most potential in the coming years.

“Smart spaces, in simple words, are interactive physical environments decked out with technology.”
Dear Client leaders & Partners

I do hope all of you, your family and colleagues are keeping good health, as we are wading through this existential crisis of COVID 19.

This is the time for shared vulnerabilities and in all humility, we want to thank you for your business and continued trust. For us, the well being of our employees and the continuity of clients’ operations are our key focus.

I am especially inspired by my GAVS colleagues who are supporting some of the healthcare providers in NYC. The GAVS leaders truly believe that they are integral members of these institutions and it is incumbent upon them to support our Healthcare clients during these trying times.

We would like to confirm that 100% of our client operations are continuing without any interruptions and 100% of our offshore employees are successfully executing their responsibilities remotely using GAVS zDesk, Skype, collaborating through online Azure ALM Agile Portal. GAVS ZIF customers are 100% supported 24X7 through ROTA schedule & fall back mechanism as a backup.

Most of GAVS Customer Success Managers, Client Representative Leaders and Corporate leaders have reached out to you with GAVS Business Continuity Plan and the approach that we have adopted to address the present crisis. We have put a communication, governance and rigor in place for the client support and monitoring.

GAVS is also reaching out to communities and hospitals as a part of our Corporate Social Responsibility. We have got some approvals from the local Chennai police authorities in Chennai to support the movement of our leaders from and to the GAVS facility and we have, through US India Strategic Partnership Forum applied for GAVS to be considered an Essential Service Provider in India.

I have always maintained that GAVS is an IT Service concierge to all of our clients and we individually as leaders and members of GAVS are committed to our clients. We shall also ensure that our employees are safe.

Thank you,
Sumit Ganguli
CEO, GAVS Technologies
EDITOR’S NOTE

With the world in the grip of an unprecedented pandemic, we seem to have been transported into an apocalypse movie. The novel Coronavirus has changed life as we knew it. As I write this, the total number of people infected worldwide crossed the half a million mark; and those on the frontlines, with limited resources, have been struggling to contain it. Even the most developed nations have been caught unprepared.

Apart from the thousands of lives that it has claimed, the virus has also rung the death knell for many businesses. With a record-shattering flood of job losses being reported and global markets tanking, it is imperative to take measures to save livelihoods along with lives. Technology is one of our biggest allies here.

Tech companies are donating their computing power to expedite the process of finding a cure for COVID-19. Various tech platforms are facilitating the screening and testing for the disease (for instance, Verily’s Project Baseline). Leaders have been appealing to people to innovate solutions for this crisis, and institutions have been crowdsourcing ideas to help as many people as possible.

This pandemic has also given an impetus to the development of technology that can be deployed via remote access by humans. This will have a significant impact in places like isolation wards of hospitals and warehouses of e-commerce companies. Robots have already been employed to administer medicine to patients. Drones have been proposed to spray disinfectants over large areas and deliver packages.

It is impossible to understate the role of tech in our lives, especially now. With most of the world under lockdowns, education, work, news dissemination, delivery of essentials, and so much more is made possible by tech.

The remote North-East European nation of Estonia may be the best-prepared nation in this crisis, socially and economically. Estonia’s economy is bound to tech and most of the country’s services can be provided electronically. They most probably will not require any major readjustment to how they work, learn and shop.

The biggest lesson this crisis has taught us is that nothing beats being prepared. It is the foundation of our resilience. Communities, institutions, and governments must work together to tide through tough times. This is the time when leadership matters the most.

In this edition, we bring some wonderful articles by Saji Rajasekaran, Sankul Seth, Katy Sherman, Vasudevan Gopalan, Gireesh Sreedhar KP, Bargunan Somasundaram, Mohammed Fazal Uddin Kashif and Priyanka Pandey. We hope you enjoy reading them. We wish good health to all our readers and their families.

I want to leave you with the below thought, written by the great humanistic philosopher and psychologist Erich Fromm.

“Hope is a decisive element in any attempt to bring about social change in the direction of greater aliveness, awareness, and reason. But the nature of hope is often misunderstood and confused with attitudes that have nothing to do with hope and in fact are the very opposite.”

Soumika Das
Editor
POTENTIAL SHIFTS IN THE WORLD, #COVID-19

Apart from the tremendous number of lives lost and the huge impact on several industries and jobs, COVID-19 has caused a lot of pain and distress. However, it has also shined light on a few areas that we can hope will see a positive impact, short-term or long-term.

Mother Earth – Less people commuting, less aircraft’s in the skies and less cars on the road means cleaner air, at least in the short-term.

Healthcare Policies – Could the delays in tests, lack of enough infrastructure to screen and poor emergency management procedures hopefully drive a debate in changing our healthcare policies for the better?

Focusing on the family – People are spending more time with family. This could be good or bad, I guess, but the shutdown has afforded many families time to be around each more than ever.

Better hygiene and better eating habits – Will this experience, at least temporarily help teach our generation to have better hygiene and help build better eating habits?

E-Learning – Could this experience provide the experience needed to make e-learning more acceptable and potentially make University education cheaper in the long-term?

Internet infrastructure – Teleworking and e-learning will stretch the internet bandwidth in homes and neighborhoods; Will this prompt the industry to speed up their investment in better hi-speed infrastructure?

Increased investment in poorer countries – The awareness that borders don’t quite stop viruses or the associated economic meltdowns in an increasingly connected world, hopefully changes the way developed countries treat poorer countries.

Growth in specific industries – Should we expect a growth spurt for cashless transactions, online grocery shopping/delivery, tele-medicine, and community based organic farming?

About the Author:
Saji is a father to 2 kids, Executive, and figuring out how to make more time to do things he wants to do; in that order.

He has 20 years of experience leading successful teams in various industry domains and holds a Masters in Business Administration from UNC Kenan-Flagler Business School.
MEET SANKUL SETH

Sankul Seth
VP, Enterprise Data Team, PSCU

Sankul Seth is a value-driven and business-oriented data and IT technology leader with a proven track record for building enterprise applications and data-driven platforms. He has delivered value with a strong emphasis on customer experience, data, and integrated ecosystem. At present, he is managing and leading a team of Data Architects, Data Quality, Data Engineers, Data Application Developers, and Campaign Marketing Developers. His focus is on transforming technologies to make it easy for the business by simplifying the process and helping organizations to define technology roadmaps and implementation strategies. He is always learning and adapting new and innovative ideas that help organizations to grow.

He has done his Masters of Business Administration (MBA) focused on BI and Data Analytics from the University of South Florida. In his free time, he likes reading and biking.

His suggestion for the current generation and future leaders is to be focused and good listeners; this helps to perceive and deliver solutions.

We are lucky to have him contribute for our magazine this month. We also bring you his perspective on data and other topics.

1. Your thoughts on the phrase, "Data is the new oil."

I can’t agree more. Oil had been running the world and making it move; however, data is the new oil. With Information and Technology mobilizing the world, data plays a pivotal role. This fact is proven by technology organizations riding the market and leading the world. Few marquee companies, i.e., Amazon, Google, Facebook, and Twitter, have shown that in this age, data resources are more valuable and an essential commodity to fuel the economy.

2. How did you discover your passion for data?

Curiosity around analyzing, correlating things with data, and innovative thinking defines my path and passion around data. Today, every moving information is carrying data and using the power of data - analytics, predictive analytics, fraud, campaign, marketing and so on. With the world evolving and newer data technology coming into the market, my interest and passion are becoming stronger.

3. What are your interests outside of work?

Reading books, technology articles, playing tennis and talking to people. These hobbies are great stress-busters and help me think positively.
4. **What have been the biggest challenges in your career?**

Finding the right talent for the correct position is the biggest challenge. In this competitive world, finding talent is a critical component and a challenging task because this defines the success or failure of your vision.

5. **How would you describe your leadership style?**

Strategic thinker and collaborative. I've consistently shown confidence and direction to the team, as a leader, I believe it is essential to define the vision for the team and to provide opportunities to the team for sharing their creative ideas.

6. **Looking back on your journey and knowing what you know now, what is one piece of advice you would have given yourself along the way?**

To be a good listener and perceive information that others are sharing, because this helps to nature your thinking and define a roadmap and vision for the team.

7. **What advice would you like to give to those who are considering pursuing a career in Data Science/Analytics?**

Passion and interest in analyzing things; this will lead you to enhance your career path in data technologies.

8. **In your opinion, what is the ideal way to lead during times of crisis?**

Be calm and look for options you have because at least one option is always open; you have to just find it.
The Crucial Component of Data-Driven Organizations

Sankul Seth

Data is a crucial component for any organization to generate revenue and provide the best-in-class experience for their customers. Various studies have shown that 60% of organizations fail to implement UI tools, which are heavily dependent on data-driven technologies because organizations spend millions on buying these tools but not investing in the right talent to achieve them. Understanding of data is the first stepping stone for any organization to be data-driven. I implemented various data solutions from inception to implementation, which helped organizations to derive data-driven decisions. After fifteen years of extensive experience across multiple data technologies and platforms, I have developed numerous critical data frameworks which have benefited organizations to be data-driven. The first essential pillar is to build a cohesive and robust enterprise data team.

Data is a driver for any business intelligence, analytics, insights, marketing campaigns, UI applications, tools, and technologies. It’s crucial to understand why and what the business needs before deciding to invest in any data technologies. Today, organizations are leveraging data for executing campaigns and defining customer 360-degree views to provide personalized and OMNI-channel experience using data KPIs. There are unlimited data tools available, and it became difficult to pick the right one, which fits all the requirements for the business and delivers a perfect solution. It all goes back to find the right leader who has deep experience on both sides of the coin (Business and Technology). It’s hard to find such talent but not impossible, and this decides the success or failure of any data implementation projects.

About the Author:

Sankul is the Vice President of the Enterprise Data Team at PSCU, is a value-driven and business-oriented data and IT technology leader with a proven track record for building enterprise applications and data-driven platforms. He believes the current generation and future leaders should be focused and good listeners, as it helps to perceive and deliver solutions.
KEEP CALM AND BE A GREAT LEADER IN A TIME OF PANDEMIC

We live in scary times. While governments call for social distancing, it becomes more important than ever to stay connected as a community. For many of us the measures around COVID-19 mean we work from home and manage remote teams. While virtual teams are not unusual, today’s situation brings its own challenges. Today it is not only about being remote, it’s about facing fears. We fear for our jobs, our health, our families and friends.

How do we help each other stay productive and connected while we are worried and isolated?

This is what every leader should do to support their teams and help them get through the difficult times:

1. Make sure everybody has what they need to work remotely. Technology goes a long way in creating inclusive collaborative environment. Ask frequently, be prepared to act to resolve issues. Know how to navigate the company to obtain resources through management, HR, and Helpdesk.

2. Mentor team members on time management, especially people who are not used to work from home. Share expectations and establish norms of how to be available throughout the day, and when to go offline. While some people struggle with home environment being too distracting, others find it difficult to disengage at the end of the day and would stay at their desks until late. Give guidance based on the unique needs of each individual.

3. Get into a habit of checking in on people without agenda - have a coffee break together, chat about things not related to work, allow to unwind. Keep your finger on the pulse! Your team members can experience anxiety, be dealing with personal issues or worried about their communities. Some will need time off, or more flexibility than usual to provide child care, buy groceries during sporadic shortages, or take care of family members.

4. Simulate reality through video chats. Being on camera helps us stay focused, engaged in the conversation, as well as look and feel professionally. It also allows to read the non-verbals and better understand the vibe of the conversation. Turn your video on every time you’re in a meeting, this will encourage others to do the same.

5. Take care about yourself! Wash hands, sleep, exercise, go for a walk, drink water. Keep calm. Don’t spread frustration and panic. Remember, people are looking up to you, so lead by example.

I am sure we will get through this as a community. Lead the way and help others!
About the Author:

Katy is passionate about:

• Leadership and vision • Innovation, technical excellence and highest quality standards • Agility achieved through teamwork, Agile, Scrum, Kanban, TDD, CI/CD, DevOps and automation • Breaking silos and promoting collaboration of Development, Testing and Operations under cross-functional umbrella of Software Engineering • Diversity of personalities, experiences and opinions.

Things Katy does to spread the word:

• Speak at Technology conferences (including as an invited and key-note speaker) • Blog and participate in group discussions

• Collaborate with schools, universities and clubs • Empower girls and women, help them learn about Technology and become engineers
**DISCOVER, MONITOR, ANALYZE & PREDICT COVID-19**

Bargunan Somasundaram

“Uber, the world’s largest taxi company, owns no vehicles. Facebook, the world’s most popular media owner, creates no content. Alibaba, the most valuable retailer, has no inventory. Netflix, the world’s largest movie house, own no cinemas. And Airbnb, the world’s largest accommodation provider, owns no real estate. Something interesting is happening.”

- Tom Goodwin, an executive at the French media group Havas.

This new breed of companies is the fastest growing in history because they own the customer interface layer. It is the platform where all the value and profit is. “Platform business” is a more wholesome term for this model for which data is the fuel. Big Data & AI/ML technologies are the harbinger of new waves of productivity growth and innovation.

With Big data and AI/ML is making a big difference in the area of public health, let’s see how the world is Discovering, Monitoring, Analyzing and Predicting COVID-19 with Big Data, AI/ML/DL technologies.

“With rapidly spreading disease, a two-week lag is an eternity.”

**DISCOVERING / DETECTING**

Chinese technology giant Alibaba has developed an AI system for detecting the COVID-19 in CT scans of patients’ chests with 96% accuracy against viral pneumonia cases. It only takes 20 seconds for the AI to decide, whereas humans generally take about 15 minutes to diagnose the illness as there can be upwards of 300 images to evaluate. The system was trained on images and data from 5,000 confirmed coronavirus cases and has been tested in hospitals throughout China. Per a report, at least 100 healthcare facilities are currently employing Alibaba’s AI to detect COVID-19.

Ping An Insurance (Group) Company of China, Ltd (Ping An) aims to address the issue of lack of radiologists by introducing the COVID-19 smart...
image-reading system. This image-reading system can read the huge volumes of CT scans in epidemic areas.

Ping An Smart Healthcare uses clinical data to train the AI model of the COVID-19 smart image-reading system. The AI analysis engine conducts a comparative analysis of multiple CT scan images of the same patient and measures the changes in lesions. It helps in tracking the development of the disease, evaluation of the treatment and in prognosis of patients. Ultimately it assists doctors to diagnose, triage and evaluate COVID-19 patients swiftly and effectively.

Ping An Smart Healthcare’s COVID-19 smart image-reading system also supports AI image-reading remotely by medical professionals outside the epidemic areas. Since its launch, the smart image-reading system has provided services to more than 1,500 medical institutions. More than 5,000 patients have received smart image-reading services for free.

The more solutions the better. At least when it comes to helping overwhelmed doctors provide better diagnoses and, thus, better outcomes.

**MONITORING**

- **AI based Temperature monitoring & scanning**

In Beijing, China, subway passengers are being screened for symptoms of coronavirus, but not by health authorities. Instead, artificial intelligence is in-charge.

Two Chinese AI giants, Megvii and Baidu, have introduced temperature-scanning. They have implemented scanners to detect body temperature and send alerts to company workers if a person’s body temperature is high enough to constitute a fever.

Megvii’s AI system detects body temperatures for up to 15 people per second and up to 16 feet. It monitors as many as 16 checkpoints in a single station. The system integrates body detection, face detection, and dual sensing via infrared cameras and visible light. The system can accurately detect and flag high body temperature even when people are wearing masks, hats, or covering their faces with other items. Megvii’s system also sends alerts to an on-site staff member.

Baidu, one of the largest search-engine companies in China, screens subway passengers at the Qinghe station with infrared scanners. It also uses a facial-recognition system, taking photographs of passengers’ faces. If the Baidu system detects a body temperature of at least 99-degrees Fahrenheit, it sends an alert to the staff member for another screening. The technology can scan the temperatures of more than 200 people per minute.

- **AI based Social Media Monitoring**

An international team is using machine learning to scour through social media posts, news reports, data from official public health channels, and information supplied by doctors for warning signs of the virus across geographies. The program is looking for social media posts that mention specific symptoms, like respiratory problems and fever, from a geographic area where doctors have reported potential cases. Natural language processing is used to parse the text posted on social media, for example, to distinguish between someone discussing the news and someone complaining about how they feel.

The approach has proven capable of spotting a coronavirus needle in a haystack of big data. This technique could help experts learn how the virus behaves. It may be possible to determine the age, gender, and location of those most at risk quicker than using official medical sources.

**PREDICTING**

Data from hospitals, airports, and other public locations are being used to predict disease spread and risk. Hospitals can also use the data to plan for the impact of an outbreak on their operations.

**Kalman Filter**

Kalman filter was pioneered by Rudolf Emil Kalman in 1960, originally designed and developed to solve the navigation problem in the Apollo Project. Since then, it has been applied to numerous cases such as guidance, navigation, and control of vehicles, computer vision’s object tracking, trajectory optimization, time series analysis in signal processing.
Kalman filter is a recursive algorithm which uses time-series measurement over time, containing statistical noise and produce estimations of unknown variables. For the one-day prediction Kalman filter can be used, while for the long-term forecast a linear model is used where its main features are Kalman predictors, infected rate relative to population, time-dependent features, and weather history and forecasting.

The one-day Kalman prediction is very accurate and powerful while a longer period prediction is more challenging but provides a future trend. Long term prediction does not guarantee full accuracy but provides a fair estimation following the recent trend. The model should re-run daily to gain better results.

GitHub Link: https://github.com/Rank23/COVID19

ANALYZING

The Center for Systems Science and Engineering at Johns Hopkins University has developed an interactive, web-based dashboard that tracks the status of COVID-19 around the world. The resource provides a visualization of the location and number of confirmed COVID-19 cases, deaths and recoveries for all affected countries.

The primary data source for the tool is DXY, a Chinese platform that aggregates local media and government reports to provide COVID-19 cumulative case totals in near real-time at the province level in China and country level otherwise. Additional data comes from Twitter feeds, online news services and direct communication sent through the dashboard. Johns Hopkins then confirms the case numbers with regional and local health departments. This kind of Data analytics platform plays a pivotal role in addressing the coronavirus outbreak.

All data from the dashboard is also freely available in the following GitHub repository.

GitHub Link: https://bit.ly/2Wmmbp8
Web version: https://bit.ly/2xLyT6v

Conclusion

One of AI’s core strengths when working on identifying and limiting the effects of virus outbreaks is its incredibly insistent nature. AI systems never tire, can sift through enormous amounts of data, and identify possible correlations and causations that humans can’t.

However, there are limits to AI’s ability to both identify virus outbreaks and predict how they will spread. Perhaps the best-known example comes from the neighboring field of big data analytics. At its launch, Google Flu Trends was heralded as a great leap forward in relation to identifying and estimating the spread of the flu—until it underestimated the 2013 flu season by a whopping 140 percent and was quietly put to rest. Poor data quality was identified as one of the main reasons Google Flu Trends failed. Unreliable or faulty data can wreak havoc on the prediction power of AI.

References:

- https://techcrunch.com/2015/03/03/in-the-age-of-disintermediation-the-battle-is-all-for-the-customer-interface/

About the Author:

Bargunan is a Big Data Engineer and a programming enthusiast. His passion is to share his knowledge by writing his experiences about them. He believes “Gaining knowledge is the first step to wisdom and sharing it is the first step to humanity.”
PREDICTION FOR BUSINESS SERVICE ASSURANCE

Vasudevan Gopalan

Artificial Intelligence for IT operations or AIOps has exploded over the past few years. As more and more enterprises set about their digital transformation journeys, AIOps becomes imperative to keep their businesses running smoothly.

AIOps uses several technologies like Machine Learning and Big Data to automate the identification and resolution of common Information Technology (IT) problems. The systems, services, and applications in a large enterprise produce volumes of log and performance data. AIOps uses this data to monitor the assets and gain visibility into the behaviour and dependencies among these assets. According to a Gartner publication, the adoption of AIOps by large enterprises would rise to 30% by 2023.

ZIF – The ideal AIOps platform of choice

Zero Incident Framework™ (ZIF) is an AIOps based TechOps platform that enables proactive detection and remediation of incidents helping organizations drive towards a Zero Incident Enterprise™.

ZIF comprises of 5 modules, as outlined below.

At the heart of ZIF, lies its Analyze and Predict (A&P) modules which are powered by Artificial Intelligence and Machine Learning techniques. From the business perspective, the primary goal of A&P would be 100% availability of applications and business processes.

Let us understand more about the Predict module of ZIF.

Predictive Analytics is one of the main USP of the ZIF platform. ZIF encompasses Supervised, Unsupervised and Reinforcement Learning algorithms for realization of various business use cases (as shown below).
How does the Predict Module of ZIF work?

Through its data ingestion capabilities, the ZIF platform can receive and process all types of data (both structured and unstructured) from various tools in the enterprise. The types of data can be related to alerts, events, logs, performance of devices, relations of devices, workload topologies, network topologies etc. By analyzing all these data, the platform predicts the anomalies that can occur in the environment. These anomalies get presented as ‘Opportunity Cards’ so that suitable action can be taken ahead of time to eliminate any undesired incidents from occurring. Since this is ‘Proactive’ and not ‘Reactive’, it brings about a paradigm shift to any organization’s endeavour to achieve 100% availability of their enterprise systems and platforms. Predictions are done at multiple levels – application level, business process level, device level etc.

Sub-functions of Prediction Module

<table>
<thead>
<tr>
<th>Function</th>
<th>Details</th>
<th>Benefits</th>
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<tbody>
<tr>
<td>Forecast</td>
<td>Predicts ticket volumes, spikes and resource utilization levels up to a year in advance.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Provides accurate resource utilization and usage predictions</td>
<td>• Reduced manual efforts</td>
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<td></td>
<td>• Dynamically orchestrates virtual infrastructure, with minimal manual intervention, on an on-demand basis</td>
<td>• Reduced errors</td>
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<td></td>
<td></td>
<td>• Reduced cost of operations</td>
</tr>
<tr>
<td>Incident</td>
<td>Predicts incident volumes and usage pattern for up to a year.</td>
<td></td>
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<tr>
<td>Volume</td>
<td>• Predicts when bandwidth, storage and application hits are most likely to spike or exceed capacity</td>
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<td></td>
<td>• Predicts exactly when a warning would manifest into a problem and suggests possible corrective actions</td>
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<tr>
<td>Detect</td>
<td>Advanced Intelligent Incident Analytics (AIIA) enable identification of patterns and situations that precede an outage.</td>
<td></td>
</tr>
<tr>
<td>Potential</td>
<td>• Forecasts exactly when you’ll exceed capacity and face spikes, then takes preventive actions accordingly</td>
<td></td>
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<tr>
<td>Failures</td>
<td>• Identifies problems even when they originate elsewhere – e.g. a change implemented in the network can cause the application to fail</td>
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<tr>
<td></td>
<td>• Uses AI logic that learn through outages and similar problems to identify the conditions leading to an outage well in advance</td>
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How does the Predict module manifest to enterprise users of the platform?

Predict module categorizes the opportunity cards into three swim lanes.

1. **Warning swim lane** – Opportunity Cards that have an “Expected Time of Impact” (ETI) beyond
2. **Critical swim lane** – Opportunity Cards that have an ETI within 60 minutes.

3. **Processed / Lost** – Opportunity Cards that have been processed or lost without taking any action.

Few of the enterprises that realized the power of ZIF’s Prediction Module

- A manufacturing giant in the US
- A large non-profit mental health and social service provider in New York
- A large mortgage loan service provider in the US
- Two of the largest private sector banks in India

For more detailed information on GAVS’ **Analyze**, or to request a demo please visit [https://zif.ai/products/predict/](https://zif.ai/products/predict/)

**References:**


**About the Author:**

Vasu heads Engineering function for A&P. He is a Digital Transformation leader with ~20 years of IT industry experience spanning across Product Engineering, Portfolio Delivery, Large Program Management etc. Vasu has designed and delivered Open Systems, Core Banking, Web / Mobile Applications etc.

Outside of his professional role, Vasu enjoys playing badminton and focusses on fitness routines.
Introduction

Machine Learning (ML) is key pillar of the Artificial Intelligence (AI) domain. ML solves problems which are unimaginable using traditional programming paradigm. During my interactions with people on ML, I am frequently asked following key fundamental questions.

1. What is Machine Learning (ML)?
2. What is the need for ML programs when traditional programs have served us well for decades?
3. What differentiates ML from traditional programming paradigm?

Let me answer above questions from a programmer’s perspective to build understanding irrespective of your ML background.

Traditional Programming Paradigm

We are familiar with traditional programming, where we use selected programming language (like C, Java, etc.) and program specific instruction or rules to process inputs which creates output we need.

Let us understand with an example. A retail store wants to write a program to find amount to be paid (Amount) given Quantity (q) and price per unit (p). We will solve this by writing code as below.

1. Read two inputs ‘q’ and ‘p’ (Data)
2. Amount = p’q (apply Rules, Rules are part of program, but shown as input for illustration)
3. Return Amount (Output)

The need for Machine Learning

Let us try to solve same problem of computing ‘Amount’ from inputs ‘p’ and ‘q’. However this time we are required to read the inputs (p and q) from a piece of paper with digits either handwritten or printed. This needs program to recognize the digits from paper (images of digits received by program) before digits can be assigned to ‘p’ and ‘q’.

Let us examine traditional programming approach (writing rules) to recognize the images of digits
received by program

1. Are rules scalable?
2. Can rules handle recognizing digits written in different orientation and styles? Say, when image received is program should recognize image as digit 8.
3. There are over 70,000 sample of handwritten digits which is commonly used (refer MNIST database, sample below), can we write rules to cover all possible combinations?

Now it’s clear to us that rules-based approach will break and it’s not practical to build all rules and program those. We need something else instead of rules to solve these types of problems and that something else which replaces rules is Machine Learning.

**What is Machine Learning?**

Let us ask ourselves

1. What differentiates the first problem statement (easily solved using rules) from the second one?
2. Why a problem easily solved by humans (recognizing different styles digits by vision), is such a difficult task for computers?

We humans learn to identify digits which are written in standard format, however when presented with digits written in different styles and orientations, we are still able to recognize the digits identifying the patterns which is the beauty of human learning process. Can we make computers (machines) do the same and learn like humans? Let us understand how we make machine to learn this task and perform like humans.

We will feed Machine Learning program (ML) with lots of data (examples) containing images of digits in different styles and orientations along with actual digit it represents (supervised learning). Say one data point will be image and mapped to corresponding digit 8. We are providing data along with intended output as input to ML for learning. Processing lots of inputs, ML comes up with Rules or Patterns or Models to map input to output we need (like humans).

This Rules/Pattern/Model learned by ML will be used to process new incoming data to produce output or sometimes called as Predictions.

**What differentiates ML from traditional programming paradigm**

The major difference between traditional program and ML is, traditional program applies rules on input data to produce output. However, ML takes output (outcomes we need) as input and produces Rules/Pattern/Models as output which are then used to process new inputs.

**Why Machine Learning**

Data-driven decisions increasingly make the difference between keeping up with the competition or falling further behind. Machine learning can be the key to unlocking the value of corporate and customer data and enacting decisions that keep a company ahead of the competition.

**Machine Learning at GAVS**

GAVS has own in-house Artificial Intelligence research team building advanced Machine Learning algorithm and techniques powering its products and solutions. ZIF (Zero Incident Framework™) Artificial Intelligence-based Technology Operations (AIOps) from GAVS is powered by state-of-the-art Machine Learning algorithms developed in-house.

**About the Author:**

Gireesh is a part of the projects run in collaboration with IIT Madras for developing AI solutions and algorithms. His interest include Data science, Machine Learning, Financial markets and Geopolitics. He believes that he is competing against himself to become better than who he was yesterday. He aspires to become a well-recognized subject matter expert in the field of Artificial Intelligence.
Dashboards are considered to be one of the key success factors of businesses. Easy access to real-time KPIs allows them to be proactive and address business challenges before they impact the bottom line.

SAP Lumira Designer, formerly known as SAP Design Studio, is one of the robust products available in the market for developing top-of-the-line analytical applications and business dashboards. However, every tool by its core functionality has limitations for some use cases and business processes. One of such considerable cases is the ability to write back to a database directly from the dashboard.

Write back functionality assists business users to modify the data while analyzing from the dashboard rather than doing it in the source system. This functionality facilitates business users to manipulate the data and reflects refreshed data in the dashboard for further review and assessment.

This article introduces the use of Lumira SDK Extension component, POST RESPONSE PARSER, which enables the core range of Lumira designer to expand its boundary to include write-back functionality by integrating external Web API into the Lumira Dashboard.

Integrating Post Response Parser SDK Extension, the Lumira dashboard could be transformed from a pure data visualization application into an interactive data management analytical application.

Data Exploration & Smart Visualizations

Dashboards are analytical tools that visually track, analyzes and display Key Performance Indicators (KPIs) to the business processes or the portfolios. It provides a comprehensive snapshot of the performance of a key component within the portfolio. KPIs are business metrics which assists the leadership team to arrive at key decisions and drive towards the goals.

Business Dashboards and analytical applications provide at-a-glance visual and graphical representation of data which eliminates the need to go through long and complex excel spreadsheets. Also, it’s time-consuming and difficult to pull out the most important business information whereas presenting that information in an appealing, visual way is more result-driven and effective.
Interactive dashboards enable us to visualize the data, filter on demand and simply click to dive deeper, quickly engage end-users, and provide an intuitive experience and insights.

Among various visualization tools available in the market, SAP Lumira has an edge being an SAP tool where end-user consumption of analytical applications is governed and secured by the SAP Business Objects BI Platform.

**Extending the Dashboard Functionality**

Lumira designer provides extensive customizations through scripting, styling with CSS and above all, the integration of external SDK Components makes it a pinnacle tool to achieve the desired functionalities.

Like any other technology, dashboards are constantly evolving, with versatility and impactful ability of integrating SDK components assisting the rapidly developing scope and scale of visualizations for the organizations.

Along those lines, Business users expect the ability to modify the data that lies behind a visualization component by providing data inputs to the dashboard while analyzing the data and anticipate the changes to be reflected immediately in the dashboard.

Lumira designer leverages support for updating or modifying the data in underlying database through write back functionality.

Benefits of write back in the dashboard:

- It transforms a traditional dashboard to Interactive analytical application which supports business data modifications
- It allows data analysis and data update from the same dashboard, rather switching over different applications for each task

**SDK Extensions**

SDK stands for Software Development Kit. SDK is set of tools, libraries, code samples, processes and guides that allows developers to create applications on a specific platform.

SDK Extension components can be integrated flawlessly into the core application to utilize its features for the customized product developments. The visualization of extension components is based on HTML, JavaScript and CSS.

**Web Application Programming Interface**

Web API is an Application Programming Interface over the web which can be accessed using HTTP protocol. Web API is an extensible framework for building HTTP based services that can be accessed in different applications on different platforms such as web, windows, mobile etc.

Integrating Web APIs into the Lumira designer enhances the dashboard functionality by adding abilities not offered in the baseline version of the tool, such as providing the possibility of writing back to the source database directly from the dashboard itself.

**Post Response Parser**

Post Response Parser is an SDK Extension, with which you can model your application to make AJAX (Asynchronous JavaScript and XML) calls to any Web API and evaluate the response for desired interactivity in Lumira designer.

Feature of Post Response Parser:

- Opens a request via AJAX call to any specific URL
- Accepts parameters along the Request
- Supports BIAL (BI Action Language) Scripting for interactive control at runtime

**Business Use Case**

In Banking, Credit Control & Monitoring department uses exception reports on their day to day operations for the analysis of their customers credit performance. Based on the outcomes, the team decides on the action to be taken for the respective customers with the various levels of audits.

Business Team faces challenges to maintain and track the remarks and comments on each customer by looking at the reports. So CCM wants to develop a dashboard with the ability to update their observations and comments on the same dashboard which in turn gets stored in database.

Lumira designer provides sub-optimal workarounds for capturing the filters and remarks with technical components like Bookmarks and Comments which comes along with the core application, but these components cannot not write back to the database, but incorporating SDK Extensions along with the core would be able to achieve the desired customization in the dashboard application.
Functionality and Process Flow

The Post Response parser integrates external Web API into the Lumira designer, this SDK extension passes the parameters from the dashboard to the underlying stored procedure in Web API which in turn updates to the database.

Snippet of process to be followed:

• Install Post Response Parser SDK Extension at client and server system
• Encapsulate the parameters as global variable and enable its property to expose as URL Parameter
• Create a Web service for dashboard to accommodate the database updates
• Define an event to trigger the SDK Extension in Lumira application
• Reload the data source through script to reflect the changes in dashboard

Conclusion

Lumira designer is competent to build Business Intelligence Applications that can be dynamic and customizable as per the business users’ workflow. An interactive prototype is the best way for both users and designers to learn about their specific needs. In conclusion, Lumira Designer with SDK Extensions offers that capabilities to accommodate our design process and it stands strong in its ability to build simple or complex Analytic Applications and Executive Dashboards.

About the Author:

Kashif is a SAP Business objects consultant and a business analytics enthusiast. He believes “Ultimate goal is not about winning, but to reach within the depth of capabilities and to compete against yourself to be better than what you are today.”
These are unprecedented times. The world hadn’t witnessed such a disruption in recent history. It is times like these that test the strength and resilience of our community. While we’ve been advised to maintain social distancing to flatten the curve, we must keep the wheels of the economy rolling.

In my previous article, I covered the ‘People-Centric’ Tech Trends of the year, i.e., Hyper automation, Multiexperience, Democratization, Human Augmentation and Transparency and Traceability. All of those hold more importance now in the light of current events. Per Gartner, Smart Spaces enable people to interact with people-centric technologies. Hence, the next Tech Trends in the list are about creating ‘Smart Spaces’ around us.

Smart spaces, in simple words, are interactive physical environments decked out with technology, that act as a bridge between humans and the digital world. The most common example of a smart space is a smart home, also called as a connected home. Other environments that could be a smart space are offices and communal workspaces, hotels, malls, hospitals, public places such as libraries and schools, and transportation portals such as airports and train stations. Listed below are the 5 Smart Spaces Technology Trends which, per Gartner, have great potential for disruption.

**Trend 6: Empowered Edge**

Edge computing is a distributed computing topology in which information processing and data storage are located closer to the sources, repositories and consumers of this information. Empowered Edge is about moving towards a smarter, faster and more flexible edge by using more adaptive processes, fog/mesh architectures, dynamic network topology and distributed cloud. This trend will be introduced across a spectrum of endpoint devices which includes simple embedded devices (e.g., appliances, industrial devices), input/output devices (e.g., speakers, screens), computing devices (e.g., smartphones, PCs) and complex embedded devices (e.g., automobiles, power generators). Per Gartner predictions, by 2022, more than 50% of enterprise-generated data will be created and processed outside the data center or cloud. This trend also includes the next-generation cellular standard after 4G Long Term Evolution (LTE), i.e., 5G. The concept of edge also percolates to the digital-twin models.
Trend 7: Distributed Cloud

Gartner defines a distributed cloud as “distribution of public cloud services to different locations outside the cloud providers’ data centers, while the originating public cloud provider assumes responsibility for the operation, governance, maintenance and updates.” Cloud computing has always been viewed as a centralized service, although private and hybrid cloud options compliments this model. Implementing private cloud is not an easy task and hybrid cloud breaks many important cloud computing principles such as shifting the responsibility to cloud providers, exploiting the economics of cloud elasticity and using the top-class services of large cloud service providers. A distributed cloud provides services in a location which meets organization’s requirements without compromising on the features of a public cloud. This trend is still in the early stages of development and is expected to build in three phases:

Phase 1: Services will be provided from a micro-cloud which will have a subset of services from its centralized cloud.

Phase 2: An extension to phase 1, where service provider will team up with a third-party to deliver subset of services from the centralized cloud.

Phase 3: Distributed cloud substations will be setup which could be shared by different organizations. This will improve the economics associated as the installation cost can be split among the companies.

Trend 8: Autonomous Things

Autonomous can be defined as being able to control oneself. Similarly, Autonomous Things are devices which can operate by themselves without human intervention using AI to automate all their functions. The most common among these devices are robots, drones, and aircrafts. These devices can operate across different environments and will interact more naturally with their surroundings and people. While exploring use cases of this technology, understanding the different spaces the device will interact to, is very important like the people, terrain obstacles or other autonomous things. Another aspect to consider would be the level of autonomy which can be applied. The different levels are: No automation, Human-assisted automation, Partial automation, Conditional automation, High automation and Full automation. With the proliferation of this trend, a shift is expected from stand-alone intelligent things to collaborative intelligent things in which multiple devices work together to deliver the final output. The U.S. Defense Advanced Research Projects Agency (DARPA) is studying the use of drone swarms to defend or attack military targets.

Trend 9: Practical Blockchain

Most of us have heard about Blockchain technology. It is a tamper-proof, decentralized, distributed database that stores blocks of records linked together using cryptography. It holds the power to take industries to another level by enabling trust, providing transparency, reducing transaction settlement times and improving cash flow. Blockchain also makes it easy to trail assets back to its origin, reducing the chances of substituting it with counterfeit products. Smart contracts are used as part of the blockchain which can trigger actions on encountering any change in the blockchain; such as releasing payment when goods are received. New developments are being introduced in public blockchains but over time these will be integrated with permissioned blockchains which supports membership, governance and operating model requirements. Some of the use cases of this trend that Gartner has identified are: Asset Tracking, Identity Management/Know Your Client (KYC), Internal Record Keeping, Shared Record Keeping, Smart Cities/the IoT, Trading, Blockchain-based voting, Cryptocurrency payments and remittance.
services. Per the 2019 Gartner CIO Survey, in the next three years 60% of CIOs expect blockchain deployment in some way.

Trend 10: AI Security

Per Gartner, over the next five years AI-based decision-making will be applied across a wide set of use cases which will result in a tremendous increase of potential attack surfaces. Gartner provides three key perspectives on how AI impacts security: protecting AI-powered systems, leveraging AI to enhance security defense and anticipating negative use of AI by attackers. ML pipelines have different phases and at each of these phases there are various kinds of risks associated. AI-based security tools can be very powerful extension to toolkits with use cases such as security monitoring, malware detection, etc. On the other hand, there are many AI-related attack techniques which include training data poisoning, adversarial inputs and model theft and per Gartner predictions, through 2022, 30% of all AI cyberattacks will leverage these attacking techniques. Every innovation in AI can be exploited by attackers for finding new vulnerabilities. Few of the AI attacks that security professionals must explore are phishing, identity theft and DeepExploit.

One of the most important things to note here is that the trends listed above cannot exist in isolation. IT leaders must analyse what combination of these trends will drive the most innovation and strategy fitting it into their business models. Soon we will have smart spaces around us in forms of factories, offices and cities with increasingly insightful digital services everywhere for an ambient experience.

Sources:

About the Author:

Priyanka is an ardent feminist and a dog-lover. She spends her free time cooking, reading poetry and exploring new ways to conserve the environment.
“Do not follow where the path may lead. Go instead where there is no path and leave a trail.”
- Ralph Waldo Emerson