

August 2020**THE EDITOR SPEAKS - Data is the Common Denominator**

We are currently in the height of hurricane season when images on the news are update hourly in order to show the progress of these tropical storms. This is a vast improvement from the 1900s, when the 1900 Galveston hurricane seemed to appear from nowhere, ravaged the Texas coast, and killed between 6,000 to 12,000 people. With our current technology, we can predict when and where hurricanes will land so the authorities can provide life and death guidance to those in the storm's path. While the hurricane's path may appear to be random to those on the ground, it is predictable but only when characterized by a wealth of adjunct data. Wind, tide, temperature, and even the phase of the moon, guides hurricanes in the Gulf of Mexico, as they accelerate, decelerate, change course, and build in power as they travel across the water. Given years of data collected

by famed hurricane hunters and others, we have a base of information that can be utilized to forecast storms and adapt our emergency responses. The wealth of weather data has helped save many lives over the years, including the recent Hurricane Laura.

The current pandemic, which has redefined the way we live and work, shares distinctly similar characteristics to a turn of the century hurricane. The virus almost appeared to come from nowhere, its progression shows periods of acceleration and deceleration, and its movement across the country sometimes feels random. This is, of course, is not true. Just as hurricanes could not be understood without sufficient data, our lack of data on the virus often makes it seem uncontrollable. And it is this lack of data that makes it difficult for individuals, businesses, and companies to organize and plan a response strategy.

Not to diminish the efforts of various government agencies, academic institutions, and other organizations to collect data (their efforts are truly appreciated), these collection processes vary widely and often cannot be easily integrated. Until NOAA (National Oceanic and Atmospheric Administration) stepped in and coordinated the collection and integration of weather data, hurricane tracking data efforts suffered. We seem to be in a similar position with respect to the COVID-19 virus.

As we begin to build the data integration framework required to assimilate the pools of virus data that are being collected, we should not only be seeking to better understand this current pandemic but we must also position ourselves to better respond to future, and as of yet, unanticipated health crises. We shouldn't stop at collecting data about just the COVID-19 virus, but we should strive to better understand the spread of all diseases.

We already collect massive amounts of data that describe market behaviors, used to predict the value of advertisement, to determine where we place products on a store's shelves, and the demand for canned onion rings during the Thanksgiving Holidays (an essential component of any green bean casserole). The use of data to inform healthcare decisions are at least that important. And, as this pandemic has made abundantly clear, healthcare

data is a determiner that coincidentally shapes our buying behaviors. It may sound cynical, but perhaps if the relationship between healthcare and economics were better understood, the need for the collection of healthcare data would have been given more emphasis. Perhaps we could step away from the debate as to whether COVID-19 is a greater health or economic threat and instead embrace the idea that data is the common denominator that serves both masters.

UPCOMING VIRTUAL EVENTS

- Sept 2-3, 2020. [TIECon2020](#). An online entrepreneurial conference
- Sept 28-29, 2020. [Privacy Conference 2020](#). An online conference covering privacy, security, and the online economy.
- Oct 1, 2020 [Horasis Extraordinary Meeting](#). An online conference focused on innovation and futures vision.
- Oct 5-8, 2020. [Interop Digital](#). A virtual conference for IT professionals
- Oct 14-16, 2020. [Cybersecurity for Smart Cities 2020](#). A virtual security conference for Smart Cities.
- Oct 23-25, 2020. [Data Con LA](#). A virtual conference on Data Analytics
- Oct 27-29, 2020. NIST Smart Regions Workshop. A virtual conference (held in conjunction with Smart Cities Connect).
- Nov 4-6, 2020. [AGC LA Virtual Business Conference](#).
- Nov 17-18, 2020. [Smart City Live 2020](#). On online conference substituting for the Barcelona Smart City Conference.

If you have an event that you would like us to include in our newsletter, please send an email to manager@i3-iot.net

READER CONTRIBUTION: Long Beach Smart-City Collaboration. Ryan Kurtzman, Long Beach Smart Cities Program Manager



On July 28, 2020, the City of Long Beach convened a group of 50 local technology stakeholders for a workshop to discuss what it means to be a smart city in the wake of COVID-19. Workshop participants broke into groups to discuss the four proposed guiding principles of a smart Long Beach: Design for Equity, Earn Public Trust, Cultivate Local Expertise, and Build Civic Resilience.

- In Design For Equity, attendees discussed how smart technology must reduce historic inequities by improving quality of life for all communities and specifically those that have been underserved. Smart cities must reframe existing power dynamics and government leaders need to disaggregate data to understand the disparate effects of emerging tech on communities of color.
- The Earn Public Trust group discussed strategies for building confidence in local government through advances in data privacy and transparency. One participant noted, “Trust is paramount. And more so in communities where technology is not available. You need trust to prove technology will benefit the residents and that it is not intrusive, that you are not here to gather data but to improve quality of life.”
- The stakeholders in Cultivate Local Expertise discussed how Long Beach can promote place-based growth by supporting businesses, entrepreneurs, partnership networks, and workforce job training. They questioned the meaning of ‘expertise’ and stressed that it needed to be centered on existing community assets rather than external principles.

- Finally, in Build Civic Resilience, participants discussed the importance of data-informed decision-making in a time of tight municipal budgets due to COVID-19. There was consensus on the power of responsive technology to address real government challenges and the need for scenario planning to mitigate the impact of future uncertainties.

Over the next few months, Long Beach will refine these four principles and identify specific action items to implement as part of a multi-year smart city roadmap.

If you have opportunities for partnerships that align with the four principles above, learn more at <http://longbeach.gov/smartcity>, or reach out to Long Beach Smart Cities Program Manager Ryan Kurtzman at ryan.kurtzman@longbeach.gov.

THE I³ CORNER

I3 Systems has completed its development of an industrialized version of the I3 software and is about to begin its beta test program. As a robust and feature enhanced version of the Open-Source software, the beta test program is expected to run through the end of the year. The expectation is that a fully supported, commercial product based on I3 technology will be formally launched early in 2021.

The I3 concept has developed a strong following in the SoCal region. While the I3 concept has followers outside the SoCal region (including some international fans), a stronger push outside the region will require we move beyond the informal friends-and-family network and seek external investors.

There was a meeting this month to discuss potential paths to re-energize the I3 Consortium's meeting schedule. As a part of the re-energization process, we anticipate redrafting the I3 Consortium charter to de-emphasize the development of I3 software tools while increasing its focus on leveraging the use of data assets in a smart-city/community environment. Historically, data has been treated as an application consumable where data is collected to support a specific application. The advent of I3 (and other tools) signals a shift in management philosophies to one where data is treated as an asset or a utility that can be shared and used for many purposes. We are examining the possibility of bringing together different community leaders to explore how data can be used as a platform to drive multiple issues that may cut across different communities. Workgroups that can be identified to pursue different aspects of this new vision in order to bring various proofs-of-concept back to the Consortium. By structuring the process this way, not only do we treat data as a community asset but we address issues as a collaborative process as well.

Financially Autonomous Vehicles by Professor Bhaskar Krishnamachari (USC)

There are many situations today where drivers have to make financial transactions involving their car — from paying for parking, tolls, and fuel or charging to service and cleaning. Psychologists and behavioral economists tell us that being faced with different choices and having to make decisions about payments continually is a taxing and stressful process for humans. It would be preferable for drivers if they could be freed from the cognitive load imposed by tedious micro-decisions involved in making payments for these various transactions on a daily basis. Further, in cases where the vehicle is in motion, taking the driver's mind off such decisions is not only desirable but in fact



imperative for safety. It is for this reason that today's electronic toll systems already automatically detect and charge drivers for using toll roads.

Vehicles are being engineered and developed to have greater autonomy not only to improve safety on the road, but also enhance productivity and convenience for their human passengers, letting them focus on what is truly important in their lives. Allowing vehicles to make independent financial transactions involved in other settings like parking and fuel or even for cleaning, maintenance or other service repairs in an automated manner would be a natural next step.

Now, I know what you may be wondering — what if the financial autonomy of vehicles results in sticker shock? In other words, could a car deplete your bank balance by paying too much for necessary services? Clearly, this will have to be thought through quite carefully. Approaches ranging from constraining the budget for each transaction or over a period of time to creating artificial intelligence (AI) tools that can find or even negotiate and bargain for the best-priced, highest value solutions, will have to be explored to offer peace of mind. Financially autonomous vehicles may also have built-in AI software that can learn their human owner's context-dependent preference between price and convenience. Should your autonomous car pick the cheapest spot or the one which minimizes the time to your meeting? The answer may depend on who the meeting is with or what it is about. These systems will evolve to get better over time. As algorithms compete for adoption, those that are good at managing the vehicle owners' funds while meeting their needs are more likely to survive.

As we move to an increasingly digital future for vehicles, from greater connectivity with other cars and infrastructure to a greater level of sensing and need for computational processing, there are other digitally-mediated economic transactions that vehicles may be involved with. These include transactions with external sensors, communication networks, computational processors, and digital storage points that are in the environment the vehicles operate in. Or they could involve monetizing the data being produced by the vehicle itself. In ongoing research at the [USC Viterbi Center for Cyber-Physical Systems and the Internet of Things](#), we are developing new algorithms, protocols and software that can help implement such transactions. For example, we recently proposed the streaming data payment protocol ([SDPP](#)), a cryptocurrency-agnostic application-layer client-server protocol that enables micropayments for real-time data from sensors that could be used as part of such vehicular systems. SDPP allows distributed ledgers to log all relevant transaction records such as invoices and payment receipts, in order to facilitate dispute resolution or to enable transaction-based trust mechanisms.

And in the future, self-driving vehicles may offload complex environment processing tasks or the synthesis of data from multiple viewpoints to edge computers deployed by the roadside, possibly as part of 5-G cellular base stations. We recently proposed [SmartEdge](#), a smart contract that would allow edge computing devices to perform computational tasks for autonomous vehicles, in exchange for payment. And [MOTIVE](#) is a system we have developed to allow autonomous vehicles to exchange data and services with each other on the road in a trustworthy manner, using micropayments. The ability to generate revenue from compute will incentivize companies to deploy road-side edge computing resources at sufficient density and keep them serviced and upgraded to the most current capabilities.

As a further step, financially autonomous vehicles may figure out ways not only to reduce the cognitive load and save on spending but also to earn for their owners. They may do so in a number of ways: by taking on paying riders,

undertaking food and goods delivery jobs, providing energy from their batteries to other cars and devices, offering computation, storage and communication relay capabilities to other vehicles, or by selling valuable data gathered by their internal sensors, without the necessary intervention of a centralized platform. Finally, the day may not be far off when financially autonomous vehicles could become secure assets that are “tokenized” using blockchain technology, so that they no longer have a single owner but instead a dynamic collection of shareholders vested in their operation. Just as corporations have their own legal identities today, laws may then evolve to treat each financially autonomous vehicle as a legal entity.

Sports, Stadiums, and Data by Jerry Power

Admittedly, I miss the college football season. I understand and accept that the current situation makes such large gatherings dangerous and I even worry about the potential for games being played in empty stadiums impacting the players and staff. But, I accept the sports hiatus as something we must do. Some things must be accepted as a necessary part of a healthy lifestyle. That said, I do look forward to the time when spectator sports reemerge allowing us to reintegrate these spectacles into our lives.

My sentiments go well beyond my support for certain sports teams. Local teams have developed deep and long-standing relationships with their fans and I am sure many share these same feelings. However, these same concerns apply to several major events that transcend the local fan base. Los Angeles has numerous big tent sporting events scheduled to occur after the pandemic passes. For example, Los Angeles is slated to host the Super Bowl in 2022, the College Football Championship and the US Open in 2023, the FIFA World Cup in 2026, and the ultimate sporting event – the Olympics in 2028. While these dates are not in our immediate future, there is the expectation that healthcare will continue to be an ongoing sports fan concern.

The ability to look forward to the return of such events in the midst of a pandemic is a good thing. Knowing there is a light at the end of the tunnel helps to provide needed motivation as we work our way through the discomforts associated with COVID-19 related restrictions. However, just as many of our pandemic developed behavior patterns will have lasting impacts once the outbreak begins to subside, it is disingenuous to suggest that post-pandemic spectator sports will be the exactly the same as pre-pandemic sports. Perhaps we will say goodbye to the hot-dog vendor who passes their franks down a long row of spectators. Maybe stadiums will increasingly rely on box seating to segment fans into traceable cohorts. Maybe the focus of the officials at the gate will be more on the temperature of the attendees (and less on their libation of choice). As a fan, I am sure the stadiums are already working to devise a plan that brings these events back in a way that does not require their fans to risk their well being to attend.

While the specifics of such a plan are still uncertain, what does seem clear is that attendance at these large scale sporting events will be a much more data-driven experience. Today’s modern stadiums already come integrated with a significant data infrastructure, originally installed to provide fans with access to Wi-Fi, to support arena operations, media, and security. The emergence of the COVID-19 virus adds another requirement to the stadium infrastructure – the need to utilize data to track fans/staff/players and their health.

Sports fans are devoted to their teams and they are also aware that diseases are easily spread in large group settings. Many fans might prefer to root their team to victory from the comfort of their home unless they feel sufficiently comfortable with the safety precautions provided by the stadium. It should be expected that some form of

healthcare testing will take place at the entrance of the stadiums and that some of this will be forwarded to county healthcare officials. Within the confines of the stadium, individuals will need to be tracked so that if a contagion is found after the event has concluded, those who have been exposed can be properly notified. Given that they come in contact with a significant number of people, stadium staff members will also need to be monitored and linked to the fans they have interacted with.

For some, this possible vision may sound a bit like Big Brother, but it does not have to be. For example, in California, there are laws that govern the use of license plate data that limit how long the data is held, how it is protected, and what can be done with the data. It is not unreasonable to ask that laws be put in place that limit what data can be collected within a sports stadium, how that data can be used, and how it must be protected.

While such a stadium based example is a very specific use-case, laws like this will be needed to govern how we leverage data to manage societal health in large crowd settings while still protecting the citizens from a dystopian culture based on unbridled surveillance.

READINGS FROM THE EDITOR'S DESK

- [Making Smart Platforms Stick](#) Platform solutions provide big benefits because common costs are amortized over many projects but it requires a collaborative approach to project management. Gains are to be had but they will not materialize without a systemic approach to the issues.
- [Why Your Next Transformation Should be 'All In.](#) Digital transformation programs are often described as moving a company from point A to B. However, successful digital transformation are really a coordinated and managed set of moves. Some impact operations and others impact the products.
- [Doing vs Being: Practical Lessons on Building an Agile Culture.](#) Times of uncertainty call for increased agility. Agility includes the need to try new things and measure the results. What is often unsaid is that the learnings must be distributed so the whole organization can learn and progress together.
- [Demise of Privacy Shield may be the End of U.S.-Europe Data Transfers](#)The demise of the privacy data shield and other efforts to compartmentalize data by geopolitical borders, construction of a data infrastructure becomes harder - an information network that has to be actively managed more like a network than a database.
- [From Treatment to Prevention: The Evolution of Digital Healthcare.](#) Digital technologies are changing the way we do health care research, medical diagnostics, and the treatment plans prescribed for patients. It also changes record keeping and preventative medicine. It is remaking the medical industry - top to bottom.
- ['Shadow IoT' is Becoming a Big Problem. Here's What You Can Do About It.](#) Shadow IOT devices cannot be avoided but it does not have to be a problem. Policy and procedures must be developed that allow personal IOT devices to exist in the workplace AND that ensure home IOT devices do not cause conflict for people working at home.
- [Covid-19 Data in the US Is an 'Information Catastrophe'.](#) In a world where policy, strategy, and operations should be driven by data it is clear that the lack of a well-designed data infrastructure slows progress and in some cases even creates situations that harm.
- [The Great Acceleration.](#) COVID has widened the gap between the have and have-nots. True for individuals and for businesses. When those at the top get a larger piece of the pie, they prosper as individuals but we lose as a society because more can be achieved by working together.
- [Consumer Decision Making in Healthcare: The Role of Information Transparency.](#) There was a time when employers provided health care plans and consumers had little choice or input to the process. As more of the

burden falls to the consumer and choices increase, consumers are asking for more data so they can make informed choices.

LET'S CONTINUE THE CONVERSATION

Please feel free to forward this email to your friends and colleagues who you believe would benefit from participation in our community. For those of you who wish to be included among those who believe that technology is a tool and that business success is achieved by skilled wielding of the tools available to us, feel free to reach out to us. If you have suggestions, topics you want to see included in future newsletter updates, or other general inquiries, feel free to email us at manager@i3-iot.net. The ideas expressed in this newsletter are intended to stimulate conversation and dialog that will lead to a better understanding of our collective future. The opinions may not necessarily reflect the opinions of any members of our community of interested people.

ABOUT CiTM

Originally founded under the guidance of USC, the Institute for Communication Technology and Management (CTM) was formed to support a deregulated telecom industry. Over time, computer and networking technologies evolved and grew changing the way we do business and live our lives. The CTM Newsletter was created as a vehicle to foster continued conversation about tech associated issues that transcend specific technologies and specific industries. CTM conducted foundational Internet-of-Things research and created a community driven IoT network vision. Working with the engineers at USC's Viterbi School of Engineering, the cities of Long Beach, Los Angeles, the County of Los Angeles, along with a host of supporting companies, academic institutions, and private individuals, this vision was turned into Open Source software that was released in December 2019. I3 Systems was formed to pursue commercial opportunities based on the work of the I3 Consortium and the concepts published in the newsletter. With this grass roots tech movement, the newsletter evolved and continues these conversations even further.

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