Communications, Information, Technology, and Management (CiTM)
- From i3 Sytems and The I3 Consortium-

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THE EDITOR SPEAKS - Embrace the Shadows

IT departments began to emerge as the use of technology by businesses increased in the '70s. At the time, it was difficult to find staff with technology backgrounds. A centralized IT department allowed organizations to build tech support teams that could serve the tech needs of many departments. While these teams did not typically have detailed knowledge of the departments they served, they provided an economic way to provide tech support across the entire organization. Over time, technology has become much more pervasive as many in the current workforce grew up surrounded by technology. As a result, departmental staffers are far more tech-savvy than their predecessors and so, with some exceptions for certain disciplines, the need to ration access to resources with technology knowledge has largely disappeared. With this change, the central IT departments evolved from being a support function to a much more strategic unit within the company. Instead of strictly being focused on helping other departments automate established processes, the role of the IT team is often intended to facilitate the adoption of new processes and the pursuit of new business opportunities. This was not a rapid change – the role of the central IT group evolved slowly over time.

Coincidentally with this philosophical shift, individual departments began taking on a larger role in managing the technology that was required as a part of their departmental mission. In many cases, companies began to adopt BYOD (Bring-Your-Own-Device) policies that established guidelines for individuals who wanted to use their own personal devices at work. BYOD guidelines often focus on the use of personal cell phones in the business setting but these principles also apply to laptops and other tech devices. Arguably, the focus on BYOD policies simplified the transition to work-at-home support structures that became critical when the COVID pandemic forced staff to work remotely.

BYOD concepts cover situations when individuals or departments introduce unexpected physical devices in the organization's network. There are similar concepts that apply to the software world. In some organizations, fiscal controls are placed on capex spending to ensure spending is coordinated across departments. However, as cloud and other SAAS (Software-As-A-Service) offerings increase, technology spending is obscured. For example, one department might purchase a logistics management software service while another department procures an order management software service. On the surface, these services are distinct from one another even though they both might use common database technology, IoT sensors, and communications services. By purchasing these technologies as a service, the policy management became more difficult to manage and the potential for integration was sacrificed.

Coupled with this shift, individual departments have significantly increased their direct spending on technology. Early in the IT evolutionary cycle, the centralized IT department budget was considered a proxy for an organization's investment in technology. Over this same time period, departments have been increasing their direct funding of technology projects and are now at a point where many experts believe that more than 50% of an organization's investment in technology is managed directly by the functional departments. In fact, in large organizations, many functional departments have created their own technology groups that are assigned to provide department support services while the centralized IT department remains focused on technology needs that are common across the entire organization.

Occasionally the press will refer to something called the "Shadow IT Organization." This concept refers to any technology decision-making that occurs outside the purview of the IT organization. The term Shadow IT sometimes refers to covert technology systems but 80% of workers report making use of shadow IT systems in an effort to meet their specific job objectives. More often than not, such activities are not hidden but done with the support of departmental peers and management. The fact that departmental spending on technology is increasing suggests that there are solid business benefits that come from embracing Shadow IT projects, however, there are some significant concerns that arise from these trends.

Some of the risks associated with the rise of the Shadow IT structures include:

- Shadow IT decision-making has the potential to increase costs that occur when multiple departments deploy similar technologies. For example, multiple departments could decide that they need a CRM (Customer Relationship Management software). CRMs are readily available in the market and each one has its own set of strengths and weaknesses. If departments were left to select the CRM system that is best fit for their particular department, the organization could easily find themselves where departments duplicated many costs only to find themselves with numerous CRM silos that impeded cross-departmental communications.
- Shadow IT projects often make dealing with privacy and security issues more complicated. Most organizations have a team that is focused on ensuring the corporation's information assets are protected from misdeeds of others and managed in accordance with the firm's privacy and security policies. If each department is permitted to make independent decisions about the technology they deploy, it is very challenging to apply common security standards across the entire organization.

- At a time when the legal system is scrutinizing the use of technology, the expectation should be that there will be new laws and regulations that govern the use of technology. The greater the centralization of these processes, the easier it will be to adapt an organization to new rulemaking. For example, many proposed data security regulations assume an organization has the ability to minimize data replication within their organization (regardless of the complexities associated with such an assumption).

In contrast to the above risks, the technology spend that is associated with Shadow IT is increasing because there are significant benefits that arise when decision-making is moved to the impacted organizations.

- Most studies have demonstrated an increase in productivity occurs when the impacted departments are given direct responsibility for technology selection and deployment.
- Allowing departments control over their technology decision-making results in a more agile organization. The need to defer to a central organization that must coordinate and reach consensus with other departments before a new technology can be deployed adds time to any deployment program (once it is finally approved).
- Encouraging departmentally focused decision making is reported to also increase organizational decision making and project satisfaction overall. When departments have decision-making control, they select technologies that meet their targeted needs with an understanding of how processes will need to be adapted to accommodate the selected technologies.

The debate that occurs around the appearance of such shadow IT projects usually centers on responsibility and standards. The central IT department is often cited as being responsible to ensure corporate technology policies are being met, ensuring the organization is not subjected to undue risk, and to ensuring efficient use of technology. This mandate simply cannot be achieved if decision-making and operations are decentralized and rendered invisible to the central IT staff. For a company to embrace departmentally distributed decision making, they also must be willing to assume a portion of the responsibility for proper care and feeding of these systems. And before any department can take on such a responsibility, those responsibilities must be clearly delineated.

The benefits associated with distributing departmental decision-making to the teams most impacted by the technology are so significant that they must be embraced. However, where these systems are treated as shadow IT systems, systems that are outside the purview of the central IT department, problematic behaviors that add unnecessary risk to the organization can arise. To avoid these issues, companies must accept that technology is not a Centralized IT vs Shadow IT debate. Technology management, regardless of where the decision-making responsibility lies, is an organization-wide issue. If a department intends to introduce new technology to the organization, that responsibility does not eliminate the need to follow organizational standards and comes with the responsibility for the department to live up to expected support requirements. And before a department can agree to support a technology, the central IT department must first publish what those expectations are.

UPCOMING VIRTUAL EVENTS

- Oct 4-5, 2021. Dubai Smart Cities Expo. Dubai International Finance Center.
- Oct 26-28, 2021. Mobile World Congress (MWC) Los Angles. Significant trade show for wireless industry held in Los Angeles.
- Oct 28-31, 2021. IEEE Symposium on Technology and Society. A virtual event hosted by the University of Waterloo and University of Guelph, Canada.
- Nov 2-4, 2021. The Infinity Festival Hollywood. A hybrid event (physical and virtual).
- Nov 16-18, 2021. Smart City Expo World Congress. A hybrid (physical and virtual) event focused on smart city technology.
- Nov 29-Dec 3, 2021. re: invent. A hybrid learning event hosted by AWS for the cloud community.
- Dec 2-3, 2021. International Conference on Urban Studies and Internet of Things. Sydney, Australia.
- Dec 9-10, 2021. International Conference on Smart Cities, Big Data, and Machine Learning. New York City, New York.
- Dec 10, 2021. Connected Communities Conference, Raleigh NC
- Dec 9-10, 2021. Conference on Urban Studies and the Internet of Things. London, England.

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

THE i3 CORNER

On Sept 21, 2021, West Hollywood hosted an I3 Consortium meeting that focused on data governance. West Hollywood has several active smart city projects and pilots underway. These projects are increasing the amount of data the City actively manages. The volume of data has become so great the city is now beginning to examine its data policies. When the volume of data and the number of projects was low, the city could establish project-specific rules; but current projects are pushing the City to look at developing a more comprehensive policy that covers both existing and future smart city projects. Some of the fundamental issues faced relating to data ownership, staff training programs, and processes for turning requirements into a manageable data policy. Ultimately, the goal is to have a federated data platform, supported by a robust set of data policies and standards.

The I3 Consortium's Video workgroup is actively working with the City of Los Angeles Sanitation Department (supported by ITA). This workgroup was formed after the City of Los Angeles outlined its desire to deploy video systems in a way so that departmental-specific projects can benefit citywide

operations. The Department of Sanitation has graciously stepped forward to be prime on this project given that they want to upgrade the Sanitation Department's vehicle-based video network. Currently, the City's Sanitation trucks have mounted video cameras that support the City's safety requirements. When this system is upgraded, the intent is that the video feeds from these trucks will permit the Sanitation Department to further improve their operations AND provide a path by which the same video can be utilized to aid other City departments. For example, the same video coming from this new system can be utilized to support both the Sanitation Department and the Streets Services Departments. While the Department of Sanitation can use the system to identify bulky items on the road that need to be picked up, Streets Services could use the same raw video to identify cracks or potholes that are in need of repair. A baseline system has been installed and we are beginning the process of considering alternatives/optimizations to that extend the architecture to enhance the system's utility.

On the I3 Systems front, the team is working to release an R1.1 of the software in October. This new release will be supported on two configurations. R1.0 of the software was certified for use on AWS whereas R1.1 will be certified to run in either AWS or a private server configuration. We have also made several performance improvements for R1.1 and have enhanced the documentation that ships with the product. Additionally, R2.0 design work has been initiated and this is a good time for interested parties to submit R2.0 feature requests.

The I3 Systems team is also in the process of creating a video that will serve as a training video and a demonstration of I3's capabilities. The video should be complete before the end of October.

READER CONTRIBUTION: Data: The New Differentiator in Manufaacturing Analytics by Doug Laney, David McGraw, and Bruce Fergusin-Augustus, West Monroe Consulting

"Data is the new oil."

It's a phrase we hear with increasing frequency in many business contexts. Companies across multiple industries now view data as increasingly essential to their success and market advantage. Data today, like oil over the last hundred years, is increasingly a source of wealth, power, and success, and a driver of the emerging digital economy. But there are differences. When oil is gone, it's gone. Data, on the other hand, generates more of itself and can be used multiple times for multiple purposes. Data is also cheaper to store and easier to transport. But it's also easier to be stolen and is impossible to clean up if spilled.

Data is also potentially more valuable. Companies with certain data characteristics that behave in data-driven ways generate economic benefits and have value beyond others. Investors now tend to favor data-centric companies. Research shows data savvy companies, like those with a chief data officer, a data science team, and an enterprise data governance function, have twice the market-to-book value as their peers. Data-product companies, for which data or digital products are the primary offering, have three times the market-to-book value. Further, data for some organizations might actually be worth more than the value of the company itself.

Maximize data potential by treating it like the asset it is

Manufacturers have access to and use data from many sources: customers, equipment, processes, transactions, quality, and IoT or streaming devices among others. They're also generating and acquiring more of it by the day. According to the Manufacturing Leadership Council's (MLC) first survey on M4.0 data conducted in March 2020, more than a quarter of manufacturing companies surveyed said their manufacturing data volumes doubled or tripled in size over the previous two years. Looking ahead, over a quarter of companies expect data volumes to surge by more than 500% over the next two years.

But what are they doing with that data, and to what extent are they using it to drive enterprise value? Manufacturers most commonly associate the value of their data with its use in optimizing operations. The MLC study validates this: 54% of participants said they measure the value of data in terms of the impact on operational performance, driving value by managing cost of goods sold; maximizing on-time in-full (OTIF); increasing capacity and labor productivity in light of labor and material shortages; or improving performance in productivity, efficiency, or quality.

Lockheed Martin, for example, recognized it could use data to proactively predict program health and apply course correction measures before problems arose. The company correlated and analyzed hundreds of structured and unstructured metrics for thousands of programs to identify a concise set of leading indicators of program performance. The analysis even uncovered specific words from a program manager's comments that were predictors of a program downgrade. This increased program foresight by three times, facilitating earlier program assessments. Ultimately, the company was able to avoid hundreds of millions of dollars in losses due to program delays.

Optimizing operations, of course, is one way to create value from data. But this is only a steppingstone in the journey toward maximizing its potential value. That requires treating data as an enterprise asset—a real mindset shift for many organizations, particularly in manufacturing.

In fact, this mindset is particularly important given the new realities brought on by pandemic-accelerated changes to the manufacturing workplace and workforce, as well as shifts in customer demand that require manufacturers to be able to change up operations faster than ever.

Manufacturers that are only using descriptive analytics to fine-tune operations will quickly fall behind those able to use prescriptive or predictive insights to adapt their operations to the velocity of the market and drive profitability.

Accountants may not recognize data as an asset on the balance sheet, but that doesn't mean companies can't begin managing it as one. Manufacturers are already adept at managing physical assets, so treating data with the same care shouldn't be too much of a stretch.

Infonomics, the emerging discipline of managing and accounting for information with the same or similar rigor and formality as other traditional assets, offers a useful framework for driving greater value from data.

It consists of three key elements: monetizing, managing, and measuring data value.

1. Monetize data directly—but don't overlook indirect methods

Maximizing the value of data begins with looking at it in terms of its economic benefits. There are many directions this can take. Direct monetization includes bartering or trading with data, selling raw data through brokers or data markets, or selling insights or analysis. But monetization is about more than selling data assets. It instead comprises any and all ways that available data can generate new value streams for an organization, both internally and externally. Indirect methods of monetization include improving process performance and effectiveness (as in the Lockheed example), developing new products or markets, enhancing/digitalizing products and services with data, and forging and streamlining partner relationships. Mastering indirect monetization can, in fact, lead to greater direct monetization.

The best way to illustrate potential applications to manufacturing is through stories and examples, and there are plenty of them.

Creating new revenue streams: Sometimes selling information is a preferable alternative to no revenue at all. When a mid-sized U.S. manufacturer of sonic buoys and other inertial sensors recognized it was losing business to lower-cost manufacturers in Mexico and elsewhere, it licensed its expertise in the form of detailed manufacturing and testing processes to those who would otherwise undercut them. Competitors became partners, and a new revenue stream materialized.

Transforming the business model: Rolls-Royce was an early pioneer of this concept with its Power-by-the-Hour offering, which it has continued to build upon. The company's CorporateCare® program, originally launched in 2012 and enhanced in 2018, uses onboard sensors to track on-wing performance and facilitate maintenance. More manufacturers are moving to a product-as-a-service (PaaS) model, which is dependent on data. For example, Michelin's EFFIFUEL™ is a PaaS offering targeting commercial vehicles, particularly trucks, using IoT data to improve performance. The offering uses sensors inside vehicles to collect data about fuel consumption, tire pressure, temperature, speed, and location. A Michelin team then analyzes the data to provide recommendations for fuel-efficient driving. This has led to higher customer satisfaction, loyalty and retention, and increased profits.

Driving value from mergers and acquisitions: When Stratasys purchased MakerBot, a startup manufacturer of desktop 3D printers, in 2013, it also acquired MakerBot's established 3D printing ecosystem, which continuously develops new applications for 3D printing. This effectively enabled Stratasys to crowdsource research and development data from the community and reduce its own inhouse R&D costs.

Responding rapidly to change: With a $2 billion orange juice business, The Coca-Cola Company must be able to minimize product inconsistencies due to variations in orange crops, sourcing, and seasonality. The company's Black Book model algorithm, developed by Revenue Analytics, crunches data from up to one quintillion data points, including satellite images, weather, expected crop yields, cost pressures, regional preferences, and detailed data about the 600 flavors that comprise an orange, plus variables such as acidity and sweetness. The result is a precise formula for how to blend orange juice for consistent taste, including pulp content. After a hurricane or freeze that affects crops, the company can re-plan in 5 to 10 minutes.

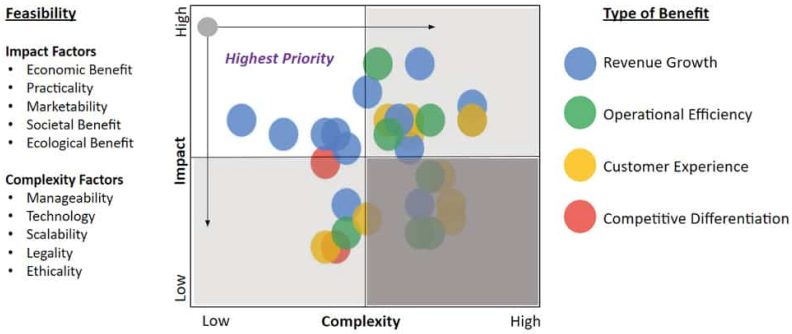
Monetizing data to achieve these types of impacts requires structure and discipline, but also sufficient space for exploration on the front end. It's helpful to start with workshops designed to conceive and refine ideas for innovating with information to drive new value streams.

For the broadest thinking, try to get business leaders, data architects, subject matter experts, and ideally representatives of key customer, supplier, or partner segments into a room together. Inspire them with other data monetization examples from inside and outside the organization and industry. Then allow them to explore available data sources and potential insights and/or external value within or at the intersection of those data sources. Ask questions like: What could we accomplish if we had additional data? What types of external data sources would enable that? Where could we add new sensors or OT sources to generate additional data that may provide valuable insights?

Then assess the ideas generated based on feasibility in order to prioritize those to be developed. This assessment should include a range of impact factors such as economic benefit, practicality, marketability, societal benefit, or ecological benefit. The feasibility assessment should also consider the complexity involved, including manageability, technology, scalability, and ethicality. It's important to make sure you vet the financial and systemic impact, as well as scalability, from a true operational perspective in an applied setting.

FIGURE 1

Data Impact Analysis



2. Manage data as an asset—and consider a chief data officer

Realizing value from data requires proven asset management principles and practices. In this context, that includes data science capabilities as well as enterprise data governance function and principles. But none of that will matter without the right leadership.

Our research has found that organizations with a chief data officer with the right level of influence, authority, and resources, reporting to the CEO or at least with a spot on the executive team, are four times more likely to be using data to transform business processes, products, or services. They are also three times more likely to generate non-monetary commercial value and seven times more likely to generate monetary value from data externally.

By contrast, organizations where the CIO still maintains ultimate responsibility for the company's data assets are only half as likely to be employing advanced analytics. In organizations without empowered CDOs, data quality and availability continue to be significant impediments to analytics.

Manufacturers should take note. From the results of the MLC's M4.0 data study, it appears they have some significant catching up to do. Only 7% of companies participating in that survey reported having a CDO who is responsible for data governance and strategy. Rather, most place data responsibility with an information technology (IT) head (the CIO or IT VP) or a joint IT/OT team. Further, 18% have no one with data governance responsibility and more than half of the participants in the study said they do not have any corporate strategy, guidelines, or plan for the way data is collected or organized across their companies.

Only 18% believe their company is "very capable" of analyzing the data it has.

Establishing true responsibility and accountability for all things data is the essential place to start. Once that is in place, you can then begin developing plans for maturing data and analytics capabilities across various areas, including strategy, technology and architecture, organization and skills, literacy, and culture.

3. Measure and improve data's potential by focusing on the three degrees of value

You can't manage what you don't measure. Organizations tend to manage data volumes and speed, but most are missing the bigger picture. Few measure data quality characteristics such as potential value, business relevancy, cost, impact on business performance, market value, and impact on the organization. For example, research shows that only 11% of organizations know the cost of their data, 12% calculate the financial value of their data assets, and 21% measure the business impact of data quality improvements. Only 4% have developed ways of measuring data value in monetary terms with an assigned dollar value, and only 7% are now beginning to measure data value against data-driven services. Further, 30% don't have measures in place to value the increasing volumes of data that digital technologies create. On the other hand, companies with executive-level CDOs are three to four times more likely to formally measure the value of the company's data assets.

To help gauge and improve data's economic characteristics, companies should start by recognizing the three degrees of data value: realized, probable, and potential. The latter reflects the value that could be derived by applying data to all relevant business processes. Proper information valuation should include both foundational measures that can help improve information management discipline: the intrinsic value of information (how correct, complete, and scarce is this data?), business value of information (how good and relevant is this data for specific purposes?), and performance value of information (how does this data affect key business drivers?). Information valuation should also consider financial measures that can help manage and improve value (what did it cost to collect this data, or if we were to lose it?), market value (what could we get from selling or trading this data?), and economic value (how does this data contribute to revenue/expense savings?).

Generate value with your data—starting today

Manufacturers now have significant opportunity to understand and take advantage of data's unique economic characteristics. The good news is that they recognize this. All respondents to the MLC study said they believe data is either essential or supportive to their future competitive success.

This represents a substantial transformation for many manufacturers, but it is possible, and positive examples are out there. In fact, in all of our research, it was a manufacturing company, Textron, the parent company of Bell Helicopter and Beechcraft, Cessna and maker of other specialized technology products, that stood out as embracing the possibilities and potential of value of data so well.

“We no longer differentiate ourselves primarily via the performance of our products. Rather, we gain advantage from our ability to monitor enormous amounts of data from inside and outside our business, find insight in that data and act on it more quickly than our competitors,” the company’s director of global ERP and analytics said. “Our finance people used to chuckle about the idea of information as an asset. The reality is that for most employees, our business is data: 70% of our employees don’t touch aircraft, but everyone touches data.”

This article was originally featured in Manufacturing Leadership Journal in Aug 2021 and on the West Monroe Website (https://bit.ly/3ui0mWFhttps://bit.ly/3ui0mWF).

What is a Data Community by Jerry Power

Dictionary.com defines a community as a social, religious, occupational, or other group sharing common characteristics or interests and perceiving itself as distinct in some respect from the larger society in which it exists. Communities are often associated with physical locations such as neighborhoods, cities, or states. However, societal structures can also create the common interest that binds the members of the community. For example, college alumni associations, political parties, or religious affiliations can also serve to define a community that transcends geographical borders. For that matter, a company’s network of suppliers and their network of partners/integrators serve as two distinct communities that serve different purposes within each community bound by a common interest. The operational rules that define the community can be quite loose (e.g. Red Sox Fans) or they can be quite stringent and tightly managed (e.g SAG-AFTRA). However, seldom is the word "Community" utilized to refer to a network of data producers and data consumers even though the data usage does create communities of interest based on the nature of the data.

Data communities are specialized communities made up of organizations that have data and organizations that want data tied together based on an intent-driven use of the data. A data community can exist within an organization, for example, there can be teams of data producers and data consumers that want to simplify the way they locate each other, exchange data, and utilize the data to increase data effectiveness within the organization. Data communities can be formed by peer organizations that both produce and consume data in different areas so those insights can be drawn by comparing or aggregating data to uncover a macro level view of the data. Data communities can also be created that link suppliers and subcontractors of a larger company or the distribution and reseller chains that carry products to market. Data communities can even be formed based on a data marketplace where buyers and sellers come together to utilize data that can answer *ad hoc* or sustainable data needs.

For these data communities to thrive, there must be a sustained level of trust between the parties. Trust is not something that can be mandated by a higher authority and it is not something that can be purchased. Yes, management may be able to dictate that parties exchange data, or incentives can be attached to encourage the exchange of data but these measures are never sustainable. Communities are not just bound together by the exchange of data but by the trust that binds the participants together. Trust must be earned. One of the best methods to create an environment of trust is through transparency and choice. Transparency requires that both parties understand the motivations of the other party. For example, in a data community, the party receiving the data must understand the data they are being given; and the party transmitting the data must understand how the data will be utilized by the other party. The parties also need to be cognizant of the fact that any exchange of data can be terminated by either party if that party feels let down by the other party. Such disappointments may be based on data that is of lesser quality than expected, if one party is perceived as being less than forthcoming in describing the use case, or a party fails to accurately disclose the level of protection the receiving party provides the data.

In business school, students are taught that to maximize the value of a relationship between two members of a community, the parties must be candid, honest, and willing to share relevant information. The same is true in a data community – benefits are maximized when data is shared freely between partners. Unfortunately, not all partnerships live up to these expectations. As a result, there is often a reluctance to share data between partners because fear of failure often outweighs the desire to maximize benefits. What is needed is a way to clearly document expectations while providing an easy way to rescind established agreements when the terms and conditions are not being adequately met. These are core concepts that drove much of the work of the I3 Consortium and led to the formation of I3 Systems.

READINGS FROM THE EDITOR'S DESK

- **Why Successful Digital Transformation Requires Speed and Agility Over a Long Period of Time.** In a digital world, agility does not mean radical change; radical systemic changes are seldom successful. Instead, a truly agile company transforms itself over a series of incremental and manageable adaptions that allow graceful evolution.
- **A Futurist’s Guide to Preparing Your Company for Constant Change.** Companies should resign themselves to the fact that the future cannot be predicted; instead, companies should prepare themselves, be ready, for many different possible futures. Anticipate and plan to avoid constant fire-fighting.
- **Government data management for the digital age.** Government agencies benefit by breaking down the data silos that restrict projects. A European approach to silo elimination introduces a central oversight organization. Other approaches embrace the decentralized nature of these entities.

- **Four myths about building a software business.** Software businesses are fundamentally different from legacy businesses. It is not just an engineering issue but cultures and processes are totally different. A McKinsey report on the nature of software business practices gives a good topic overview.
- **Using data ecosystems to gain an unbeatable competitive edge.** Studies show high-performance companies have data infrastructures that allow participation in data ecosystems. Benefits from ecosystems are not free; it requires tools to manage privacy, security, record keeping, and access authorization.
- Digital Transformation: Thinking Beyond the Core of Your Business Can Help You Grow. A digital transformation project is not transformative if all it does is automate an understood system. For a process to be transformational, it must allow a company to pursue an opportunity outside its current core business.

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. If you have suggestions, topics you want to see included in future newsletter updates, or other general inquiries, feel free to email us at admin@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 I3/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 to change 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 grassroots tech movement, the newsletter evolved and continues these conversations even further.

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