



THE CHIEF INFORMATION OFFICER (CIO) IS DEAD

Long Live the Chief Innovation and Operations Officer

Abstract

A forward-looking approach at how the role of the CIO has evolved past the relevance of that title and is now much more operational. This new CIOO requires collaborative and servant-leader skills and broad knowledge and experience of operations and technology. This paper presents practical observations and recommendations as use cases to demonstrate this operational shift and needed evolution of technology leadership.

Finch, Eric
Chief Innovation and Technology Officer, Mayor's Cabinet
City of Spokane
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Executive Summary

The landscape of technology has changed and continues to change. “Disruption” has become a positive word and indication of innovation or needed change. In decades past in IT, we focused on the near exact number of devices that matched the administrative staff you had. In the next ten years it is estimated that the typical mid-sized city will have upwards of 100,000 Internet Protocol (IP) edge devices that will be operational in nature across all lines of business. The number of sensors may in fact exceed the population of a city in the future.

This massive change, including devices that are third-party or connected to hosted systems, must be planned from a leadership perspective as well as a technology and operations perspective. Technology leaders must accept the evolving operational and connectivity role or more technology silos will develop and integration, security, and shared understanding across the organization will be even greater challenges than they are today.

The cabinet-level role for technology and innovation is needed more than ever, but as the title of the article suggests, we have outgrown the “Information” word in CIO as it does not fully encapsulate the vast array of specialized and highly operational technologies that exist and continue to transform our government organizations. This leads to three key points.

First, current and future technology executives and organizational leaders must accept the fact that technology is operations. There is little or no separation from the business process to the technology process any longer, and in many cases a full dependency on technology exists. This presents new continuity and resiliency risks unlike we have seen in the past. We are not “technology enabled” any longer, we are “technology dependent.”

Second, the technology executive in accepting the operational mantle must accept the fact they are not the primary decision maker for operational technology. That must be driven by the line of business, and informed, influenced, and supported by technology. We have examples of this from major software implementations, where that dedicated joint business and technology team is formed to support major decisions and successful implementation.

Third, a hybrid approach to leadership and structure is recommended where the department and technology executives jointly hire and empower an operational technology leader and team that serves the day-to-day department operational needs while maintaining the technology planning, connectivity, integration, security, and strategic requirements for the technology group. This true joint construct defeats the “mine versus yours” debate and makes both fully executives accountable for success.

Observations and recommendations are presented below as use cases to demonstrate this needed shift in technology leadership, how past IT standard practices and service levels are changing, and how the increased focus on operational technology will dominate in the future.

Those that do not change with this operational mindset will fail, simply put. It is not enough to run a good data center, service management help desk, and have your application staff follow good project management and development standards. The future of technology is with increased support to line-of-business operations while in parallel maintaining a secure and resilient enterprise ecosystem. With the right leadership and vision, we can do this.

The changing technology leadership landscape

Something has happened over the past ten years that cannot be ignored. I was surprised in part to realize how much operational technology and IP-based devices were replacing mechanical or electric devices on the edge when I rejoined local government in 2015 after twenty years in the private sector and active military service. The “Internet of Things” (IoT) was implemented and growing in local government which gave me a much deeper appreciation of the benefit of these technologies. Everything from sprinkler heads to garbage trucks, fire trucks and police cars, parking meters and RFID-tagged library books, water well heads and storm water floodgates, and at utility enterprise level for our dam, sewer treatment plant, and waste-to-energy plant. It did not take me long to realize the investment in “operational” technology was significantly greater than that of “information” technology and was rapidly expanding into every department and every service area, especially where they touched the public.

This brings new questions and challenges for leadership of government technology. What is the core technology group’s roles and responsibilities when it comes to innovation and technology happening in departments versus “in the server room”? What is the role of enterprise or central IT when you have technology implemented at the edge and transmitting data over various platforms back for immediate operational review and decision making? How do you look an innovation versus central “technology standards” and enterprise planning?

Most importantly, what does the leadership of technology need be in the future to be operationally successful? What should we retain of the past “CIO” role, and what is significantly different? We must look at the current challenges and changes in the technology landscape, the “centralized versus federated” technology debate, and the future of technology democratization and disruption at the operational edge. There is a growing need for innovation and operational-focused technology leadership to plan for and implement the technology that is here today and coming tomorrow.

The relationships and collaboration with our departments is increasingly important as they become more technology aware and enabled. As the current generation of executive leaders retire and new managers and executives that are digital natives start leading there is increased demand for smart technology and innovation to drive service enhancement and efficiency. The desire and capability for real time information flow is here now; and demand continues to grow. Our stakeholders as operational subject matter experts must be partners in the increasingly specific operational technology requirements along with technology expertise to ensure successful implementation. Those operational leaders need to understand that technology does not exist on an island and will be part of an overall ecosystem. Both sides are dependent on each other for this success, and the landscape I see is an operational technology environment where true partnership and collaboration is required from operational experts and technology experts to meet the growing needs of government organizations.

Why do we need to change how we lead and serve?

In the beginning, technology was created and was the purview of scientists and mathematicians that did not require social skills. Then came service level agreements and business process engineering, and organizations saw it and said it was good. For almost 70 years, technology has existed as a field built on specialized technical skills where most technology advancement happened within the technology group direct sphere of influence.

Over the past 10-15 years, I suggest this has radically changed not just in terms of technology penetration but also in the skills and understanding of department stakeholders in the use of technology and information. How to lead an increasingly distributed and democratized technology landscape in our organizations is the current question. The recommended approach is joint leadership of technology that evolves the service-level model to true joint ownership model with increased distribution of technology support to the operational level and ensuring technology strategy and planning occur jointly and cyclically including all stakeholders.

Government is further unique in the broad scope of different services that must be supported. Prioritization and information-based decisions must be made across these different lines of business on a real-time or near-real-time basis every day in very different operational ways. Look at the vast variety of services a state or local government offers:

- Criminal justice and courts
- Police, fire, and emergency management
- An array of utility services including power, water, sewer, signals, and communication
- Housing and human services
- Business services
- Planning and development services
- Engineering services
- Code enforcement and inspections across construction, bridges, and events
- Right of way management
- Parking
- Parks
- Libraries
- Internal services like HR, Finance, Technology, Project Management
- And the list goes on...

Many these operational services 10 years ago were still primarily paper or semi-automated process activities. The low-cost edge/mobile device technology and specialized operational software and hardware innovation has permeated each of these service areas with increasing complex and unique systems with an increasing trend of hosted and/or Software as a Service (SaaS) products. This has redefined the strategy and requirements for local data centers and data storage and created new challenges for secure information sharing and access.

There is a fundamental change in the power balance related to technology decisions needing to be closer to the department level to meet the operational need. This is not a new concept, as it has happened over time for larger systems for finance or public safety. What is new, in this

recommended approach, is the need for true joint leadership of technology that includes both the operational and technology department executives.

Two basic technology leadership models emerged from the last century as IT shops came out from under the shadow of Finance departments: a centralized IT model and a federated or distributed IT model. It is no surprise that technology leaders had a bias for the former and operational departments had a bias for the later. The ability to have a true “matrix” organization is always more complex, and at the end of the day someone wanted to have the ultimate “authority” for IT decisions. Neither of these approaches work today. The approach recommended is an evolved hybrid leadership model that makes both technology and operational departments accountable and provides better clarity on what joint decision making and operational support roles mean for organizational benefit and alignment.

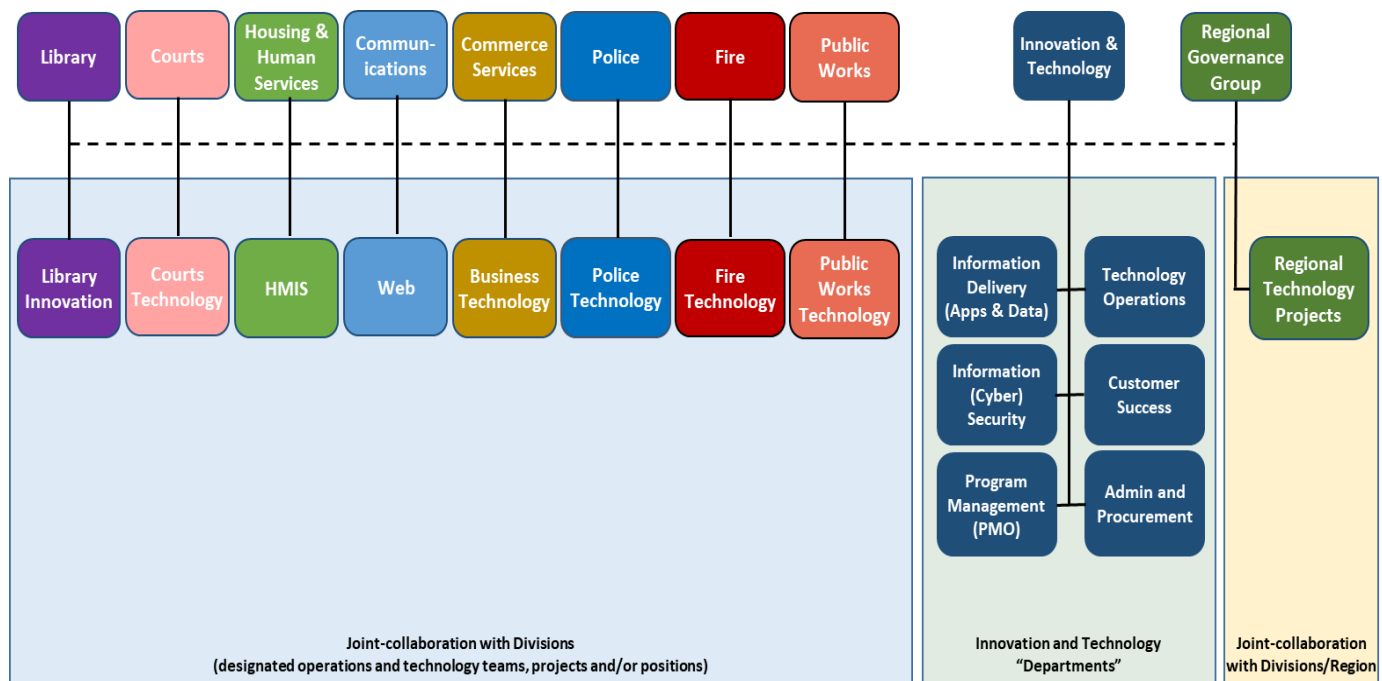
This recommended model is a servant-leader and service model approach to connect the day-to-day operational support and ownership as far down in the departments as possible. This is to ensure business alignment and the technology meets the operational need as well as providing real ownership to those departments. The strategy, planning, and assistance in determining how this technology need fits into the overall organizational ecosystem are the role of the technology group. The failure of the original distributed model is it ignores the fact that something needs to be connected to a technology ecosystem that has dozens or hundreds of other systems and technologies. The failure of the centralized model is that it often does not understand, or cannot keep pace with, the growing operational technology landscape that a department requires. Innovation is happening in our departments much more than in IT shops and that must be empowered, informed, and led.

Consider any current example of a successful major technology implementation. We can also take lessons from more than 30 years of Enterprise Resource Planning (ERP) initiatives that have either gone well or not gone well. The common thread on successful implementations, in my analysis and experience, is when collaboration or joint ownership of the problem, the analysis, and the solution was achieved. I can find no recent example of a major implementation that went well by doing a fully centralized or fully distributed approach. All business cases have discussed forming a joint team of business and technology leadership and expertise that was focused on the same goal. Technology and operational departments must be partners, building and expanding the same aircraft as we are flying it together. The only unilateral power one department has is for mutually assured failure.

Observations and recommendations on hybrid technology leadership

This section looks at specific examples of hybrid technology leadership. It makes observations and recommendations to demonstrate the needed change of technology leadership to be more operational while maintaining strategic technology planning. The intent is to provide practical examples of how to apply this model to an organization.

The technology executive of the future may be more akin to the deputy Chief Operating Officer (COO), or City/County equivalent, in terms of influence and understanding on department services based on the depth and penetration of technology those departments require. Additionally, like the COO role, the future technology leader must help visualize how those different operations need to connect and share information or resources to support the right strategic outcomes and goals of the organization. This introduces what I have termed the “Chief Innovation and Operations Officer” (CIOO) role which better describes the emerging role of the technology executive in government.



The organization chart depicted above is an example of this hybrid leadership structure. Note the area in green that are the staff in the central technology group directly. Note the increased growth of more directly connected operational technology functions which the future technology executive has the “dotted line” or collaboration and influencing leadership function. This must be codified by written agreement with shared executive leadership authority over those technology leaders and staff. This promotes the joint ownership and mutual planning required to be successful, while promoting business focus and a level of independence that can help cultivate innovation. This structure is not perfect and requires more energy and time committed to partnership and understanding of each department’s current and future needs. It gets better technology outcomes by influencing versus mandating, which can make centrist

technology executives uncomfortable. My point would be that you are NEVER supposed to be comfortable or sedentary in a dynamic and increasingly operationally focused technology environment that is here today. The new CIOO must be that trusted and respected “#2” for departments. That to me, is definitive servant leadership and public service.

Innovation through technology and better business process continues to be a focus for the technology executive. It is not enough to run a good shop and react well or keep your support goals and not exceed the budget. Where CIOs often fail is that they are not proactively looking down the road operationally to better advise and plan for the technology that is needed tomorrow. The future leaders must be operationally savvy, with an understanding on how technology can enable and empower the workforce across multiple business lines while sharing an economy of scale on the technology ecosystem. They must be that trusted advisor to different lines of business and may require a technology leader dedicated at that department level to help focus on those operational needs.

It is my experienced view that the CIO role has permanently shifted to be an innovation and operations technology support role. IT is now operations, and those operations are increasingly fully dependent on technology. Our leadership of this function must evolve to be more operational and push technology planning and support resources closer to where they function to meet the growing needs of government organizations.

Observations and Recommendations

Observation 1:

One is hard-pressed to find a department that does not have operational specific technology. The fact is technology is omnipresent in society with an expectation for digital options for any service. Even in areas like tree management, historic preservation, or sprinkler systems there is a vast number of software and IP-based device options that enable more instant information and operational decision support. Instead of the concept of core technology systems, the reality is EVERY business line has a core set of technologies that need to be supported. Innovation is happening in our departments at a faster pace and greater depth than in central technology. This requires better partnerships, collaboration, and joint ownership.

Recommendation 1:

This observation supports the need for increasingly specialized and department-focused technology support and understanding of the business needs. Support requirements continue to grow and are increasingly first seen and experienced at the department level. Technology solutions are presented at business/service-oriented conferences directly to those department users and leaders, not at technology conferences to technology leaders. Implementing a technology support structure that joins technology and department roles and positions and appoints a leader for that technology support function is critical to future technology success. This enables a technology leadership that is responsible to that department for operational outcomes and to technology for strategic and ecosystem outcomes. Joint ownership, and budgeting, of those positions allow mutual ownership of

resources and success. This joint leadership position also becomes a much easier path to consolidate the IT and non-IT technical staff into one structure without the friction of “moving them” to IT or the department under the older organizational models and becomes a powerful way to prevent “shadow IT” while empowering department technology innovation.

Observation 2:

Department stakeholders and leaders are technology knowledgeable with an increasing trend of digital natives that demand innovative technology. They will need a greater role in technology decisions. There are still those that do not understand (or care) about the need for holistic technology planning and ecosystem integration, and may believe a vendor when they say, “does not require central IT support.” This dichotomy requires unique engagement and a breadth of leadership skills to influence and advise and positioning an operational technology leader in that department can help deliver better business outcomes.

Recommendation 2:

Establish unique leadership agreements with each department for joint ownership of technology support and create a technology leadership role that reports both to the department operationally and the technology group strategically. We have found remarkable success in yielding the day-to-day operational technology support and prioritization and establishing core teams that discuss resource loading or prioritization. These agreements also define which positions are in the joint structure, how reporting and prioritization works, details any budget sharing, or costs, and sets the management expectation for ongoing joint cyclical review and planning. There is overhead in creating these unique leadership agreements, but it is also an opportunity to formalize the relationship and collaboration desired, and expectations for both departments and staff. This becomes the evolutionary replacement of service level agreements (SLAs). By signing it at the C-level, with the COO or equivalent City Manager also signing, it is a transparent structure to the support relationship that provides for escalation if necessary to make a prioritization decision.

Observation 3:

The increasing penetration and democratization of technology at the operational level is changing the definition of what a technology or “IT” role is. As more of the workforce uses and manages technology and data daily, the need for closer connected technology support for those business functions continues to grow. Department staff, by their function, fulfill many tasks of what use to be an “IT” task in the past. Technology democratization continues to challenge the traditional service desk and SLA model.

Recommendation 3:

As technology permeates the organization it is beneficial for support of that technology to happen at the lowest level and be more responsive. If a department resource has the skills and training to fix or perform a task with department-specific technology in five minutes, why

put in a ticket at the central help desk where the responding personnel may or may not know about this specific technology? That is not an efficient model. Nor can we build a technology support organization that can be staffed and trained on the 300+ unique technology platforms that are there and growing. To meet this need, we see a trend of department level staff empowered and trained on unique technologies being part of the overall technology support umbrella. In past organizations these have been called “key support personnel” or “department technology support representatives” with additional or updated duties in their positions but still within the department. Cyclically they receive training and attend planning or other workshops to help inform and advise on department-related technology needs. When joined with the central technology support roles, this becomes a way to extend department-focused support without adding a considerable number of new positions. It also acknowledges the fact that the department roles are themselves changing and taking on more technology-related duties. Like hybrid technology leadership, I do not think we can afford to say a position is either a technology position or it is not one. The lines are blurring, and we must develop an organizational structure that allows these department roles to evolve and increase the technology support footprint. The service desk with the higher expertise and tools become the mentors, advisors, tool and template providers, trainers, and second-level support resource when something is beyond the skills or availability of a department resource.

Observation 4:

The CIO is dead. More than ever before, the technology executive must be an expert integrator, advisory, and collaborator that is operationally savvy. They must be line-of-business minded and able to look across the organization to align and integrate technology in a diverse landscape. They must find a way to do this as a servant leader, as a mentor and influencer, by building relationships of trust that demonstrate support to a department and understanding of their operational needs as it relates to technology. They must be ok with the influencing role, understanding that operational departments are going to have an increased need to make decisions on technology that directly supports their departments.

Recommendation 4:

The basic premise here, using servant leadership principles, is that a technology executive can get a much better outcome by giving up primary decision authority on operational technology while requiring joint ownership and leadership for technology planning. Establishing a joint technology function and technology leader for a department that reports operationally to the department promotes alignment and collaboration. It is no longer “yours” or “mine”; it is “ours”. This has significantly improved the relationships with the departments and defeated the longstanding issue of “who has the authority”. Ceding the day-to-day operational focus to the department and a joint technology leader empowered has helped overcome operational competence concerns. It also establishes a collaborative leadership structure to ensure engagement, joint planning, and prioritization of effort. This fundamentally changes the role of CIO from the defacto technology leader to a solutions finder/provider and integrator understanding that subordinate department technology or

operational leaders may be more knowledgeable on technology in those unique areas. On the enterprise technology side, we extend our reach into operations by this staffing model, with more dedicated support to planning, and are more involved in the ecosystem aspects of technology and connectivity. A hallmark of this model is the agreement to jointly plan for technology in future years and have shared responsibility for the human capital.

Observation 5:

The organization's network, and capability to connect and manage data and devices across geography and different platforms is forcing a different view of architecture and security to enable increasingly complex IoT and edge device solutions. Vendors increasingly have bundled services that create unique or duplicative networks that need to be managed, secured, and integrated into the organization's technology ecosystem.

Recommendation 5:

The ability to design, implement, and expand a layered set of physical and virtual networks is key to technology support over the next decade. COVID helped push organizations to understand that the entire workforce is a mobile workforce. There will always be a need for an enterprise network, and the ability to connect as an ecosystem securely and flexibly will define the future agility of an organization. The reality is that the ecosystem now and in the future is a hybrid of physical and virtual connections with the need to segment, layer, secure, and tunnel information. The technology enterprise must build a topology that helps physically and virtually connect users and devices, with an understanding that there will be thousands and tens of thousands of IP devices that transmit or use data within the next 10 years. By designing and implementing this network and connection capability with open and secure layers allows these devices and users to get a level of service they need at the best cost. Setting up a part physical and virtual network for vendor owned/supported IP devices such as vending machines, HVAC systems, among others allows greater flexibility to connect while ensuring separation for information security or other concerns. The days are over of the unilateral statement that a third-party or department level IP device "won't be on the corporate network". We are the internal network and ecosystem provider and must develop and support diverse levels of service for the different connectivity needs of the organization.

Observation 6:

The old-style "technology standards" approach to product or service selection does not work in a disrupted or innovative technology culture. Technology organizations must adapt to multiple supported technologies from a "technology ecosystem" perspective that allows for flexibility and calls out unique requirements for specific resourcing.

Recommendation 6:

Technology standards have always been hard to implement, manage, and maintain. With the disruption happening at the operational and department level, I would submit that less may be more for enterprise standards. No, this does not mean the wild west and unmanaged

technology. What this does mean is that a simplification of standards may be needed to maintain pace with diverse operational needs. Our Public Works department was building an advanced sewer treatment plant where the technology invested easily was double the rest of the annual technology budget combined. The company had built seven of these facilities nationwide and had their own proven operational technology standards. Some of their standards did not match our internal standards for technology. We could not realistically “force” our central standard on an extremely specific and unique set of operational technologies that we have never implemented. As we assessed this need, we learned the importance of that operational standard, and agreed it was in the best interest to match the operational best practice. We also agreed that this new technology must be supported and together with the department funded a position to support it. That added depth to the enterprise team, allowed focused support for a major technology support function, and allowed technology to extend the services they support for the organization. This experience shows that the new distributed technology environment requires a unique perspective on central standards. Organizations have true enterprise-wide systems and need to have standards for the organization. Increasing flexibility and leveraging department expertise on unique requirements all must be weighed as part of those standards.

Observation 7:

The “Service Level” approach and ITSM is not sufficient for the needs of technology enabled departments. The increasing democratization of technology means department level staff must be part of the service and support framework.

Recommendation 7:

The service level agreement (SLA) approach was the gold standard 20 years ago. It would list response times and goals for uptime of services. Technology leaders must embrace a change in service management approach to focus on the improvements needed, continuity of operations and disaster recovery for departments with operational technology. A great exercise, especially at time of planning and budgeting for the next period, is to make a detailed review and mapping of the technology provided to a department with a business impact analysis (BIA) score. Looking at history, which technologies have had outage or service impact issues? What could be done to improve or mitigate? The challenge with an SLA is that it is a goal and then a rear-view mirror. Yes, it sets a standard and expectation for service response that is noble and good. It does not necessarily help us mitigate or react to an issue to build organizational resilience. After building the matrix of technology and service impact for a department, those service and technology dependencies with the most potential impact require a forward-looking plan to improve service, mitigate risk, and/or respond to a critical issue. This type of active mitigation and response plan may be of more benefit to a department than setting the % uptime and response time goal.

Observation 8:

The Cloud and “Software as a Service” models have changed the landscape and created new barriers to integration and data sharing that are challenges for the technology ecosystem. A department may not understand this data governance and hybrid data environment. Any new system must have a data governance and data sharing plan created to help ensure selection of systems that can provide the most interoperability and connectivity, while maintaining secure and managed access. Continuity of operations requires a specific look at system and data resiliency to ensure critical operations can be performed in a disaster response scenario.

Recommendation 8:

I still hear “well, it is a Cloud application, so it doesn’t require anything from IT, and you will always be up.” The unfortunate reality of all this great disruptive and specialized technology is that was built to do a specialized set of functions, not necessarily to fit seamlessly into a modern government technology ecosystem. Education, and more digitally knowledgeable department leaders, are improving this perspective but there is still a great debate on how to manage dozens of different specialized Cloud platforms that need to interface with one or more other systems. There is also a significant need on data access for public records requests and more comprehensive integration of information to tackle multi-faceted government problems like criminal justice or homelessness. Increasingly, the technology executive must be able to help visualize how data and systems may need to be connected (and data shared) to provide information and shared understanding to decision makers and elected officials. A department is going to select a hosted system to fulfill its core operational requirements, with a sprinkling of others from technology, finance, or administration. Less often is it fully seen in the context of how it may be used after it is implemented or how it may need to connect to other systems or agencies that could benefit. People are smart, and once that new system is online, they develop amazing ideas that generate interface needs to that system. It is recommended that a senior technology member that is operationally savvy be on a system selection process. This can help identify connection and data sharing needs to make it part of the overall implementation plan. Often, the system being replaced (digital, manual, or a combination) had a series of interfaces and workarounds built over its lifecycle that need review and may not have been identified as core business requirements. Without this early review, department and technology staff are left to discover and develop these needed interfaces without budget or planned resource time. Putting both the operational staff and technologists together allows a comprehensive understanding of how a hosted system fits into the ecosystem so a better selection and implementation plan can be developed.

What happens if we do not embrace this needed change?

We have all met managers or executive that have been resistant to change. There is still a gap of understanding at the top executive levels in some organizations as it relates to the penetration and dependence on technology for day-to-day operations. If we do not evolve to a better joint and operationally focused leadership model, there will be failures on implementation and support of those technologies. New barriers will be introduced to information flow and duplication of effort and cost will be experienced.

IT shops that fight for centralized decisions and a “one standard” approach will increasingly find themselves with complaints on not understanding the evolving business need, growth of shadow IT, requests or mandates for distributed IT, and friction in the board room over now technology decisions are made. It is always easier to enforce “one standard” and manage by it to reduce support requirements. This ignores the fact that technology by its nature is disruptive, and as that technology has moved into departments and is mobile and distributed, a central model will not be able to ensure the support keeps pace with operational demands. In short, I believe the centralized model to be dead along with the CIO, we just have not fully accepted that yet.

Departments that have true federated technology support structures generate demands on information security, data access, network access, standards and audit reviews, budgeting, integration with enterprise systems, and other “ecosystem” requirements. They are not staffed to manage these independently and this can result in significant operational duplication, cyber risk, and resiliency risk if not coordinated. It is easier to run a smaller group, more directly aligned to a department. This fails to appreciate that most departments are not independent islands, and the organization cannot accept the risk or cost of having that level of unmanaged duplication.

The City of Seattle is a textbook case where the pendulum swing between a federated to a central IT model did not work. This centralization was written in the city charter, effectively a mandate. Mandating the technology group and CIO as the primary decision maker in all technology had the unintended consequences of significant service disruption to departments as staff was consolidated, negative relationships with department executives developed, and collaboration suffered on how to make technology successful at the operational level. The pendulum swung from duplication and lack of integration (which were real problems) to an approach that favored consolidation and efficiency to the point of not understanding the business service needs so quality of service dropped for departments and the constituents they served. At the end of the day, this approach failed. The all or nothing authority approach in my view, does not work.

Developing a hybrid structure, and appointing technology leaders focused on department operational technology that have joint responsibility to the department for day-to-day support and to the technology group for technology strategy, life cycle and integration is the best solution I have found. It has defeated the longstanding complaint of “IT not understanding our business” or not being responsive to a department’s needs. What has happened is deep and meaningful relationships with executive and staff leadership across the organization that has led to great innovation and support for our departments and those they serve.