Getting real value from digital innovation: a guide for utility companies

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The utility market has never been under more pressure, and customer demand for a great service experience delivered in an affordable, sustainable manner continues to grow. The pace of change in this competitive industry is accelerating, driven by greater demands from regulators, and the rising expectations of customers, both of which can be met by embracing change through innovation.

At the same time, security has never been so critical. Aging, end of life and unsupported infrastructure creates compliance and safety risks that leave critical national services vulnerable to attack by increasingly aggressive and determined threat actors.

By updating operating models and modernising the underlying communications technology, utility organisations can significantly enhance operational efficiency, improve the service experience and strengthen security.

But effectively leveraging digital technology requires strategic thinking around technology procurement. Simply updating system elements as issues arise without considering future requirements and opportunities fails to exploit the real value that can be achieved from your investment.

The speed with which technology changes and becomes redundant means infrastructure cannot be considered in the same was as any other investment. Procurement process and price remain key, but redefining 'best value' is critical for utility companies at the beginning of their digital transformation journey. Physical infrastructure won't last forever, and the pace of change in the industry means every individual purchase must now be considered as part of a wider strategy to take control of infrastructure as a whole. The future network is more than the sum of its parts.

By operating and reacting at a tactical level to fix immediate issues, and considering the lowest price to signify 'value' through the procurement process, utility companies can miss opportunities to position themselves more successfully within a wider strategy that will save time and money and reduce risk in the future.

Maintel works closely with a range of vendors with the technology that allows customers to embark on a controlled long-term journey that will reach the desired ultimate outcome – and each step of the journey can take place when budget allows. By engaging our customers in a long term strategic review of investment goals within the relevant regulatory framework (ED2/AMP7), we can align vendor technologies and products to an "future state" vision for their communications

infrastructure. This approach results in a longer-term Transformation Programme which can more naturally break down into manageable projects, over multiple investment periods where necessary.

Case Study: Electricity Company

Faced with aging technology infrastructure, much of it out of vendor support, this electricity company understood the risk of vulnerability from the switches running the core of its network as they reached end of life. Budget was tight, and the company were looking only to fix this specific problem. Maintel's consultative approach highlighted the potential problems arising across the entire aging infrastructure, and the optimal future state which would allow for more efficient operation and reduced day to day management requirements. By starting from the desired end point and working backwards, the immediate problem was solved – the switches were replaced – but as a strategic step that would support a long term transformation strategy.

A new network vision

All types of utilities are finding it challenging to deliver against increased regulatory demand and customer expectations in a way which is both cost effective and reduces the risk of failure. The communications network architecture of a typical utility is now highly complex and needs to facilitate connectivity for a diverse range of information and data sources. From legacy but critical supervisory control and data acquisition (SCADA) & telemetry systems to a wide range of data networking end points which now extend to IOT and wireless devices, a new approach is required. Evolution of this type of environment without inadvertently causing communications network outages is essential, as affecting the customer experience is unacceptable.

Transitional change risk can be reduced by implementing robust and critical change control processes; however, these add to the risk management overhead, stifle agility and necessitate change freeze periods for service delivery protection at critical times. Change Advisory Boards (CABs) are an important but necessary safety gate to protect critical infrastructure, but they also represent a rather costly and blunt instrument which can slow down the adoption of innovative technology that can help you achieve your business goals.

Many traditional networks have been forced to evolve over the last 10 years as the proliferation of network attached devices has shifted from wired to wireless connectivity as the default attachment model. This presents increased cyber-security threats, which result in a corresponding increase in security solutions overlaying the entire network. Add to that the new services that are now available from a multitude of IoT devices and you have the perfect storm for a network which simply wasn't designed to cope with such operational demands.

Networks of the past were designed for simple, static workflows like connecting an office user to the Internet or to email. Today's workplace is dynamic and wireless. It requires a network that can adapt and change on demand. Moving from a legacy network to a modern, scalable, secure infrastructure enables your business to succeed and grow. The network is no longer the bottleneck, it can instead be the enabler for success. This architectural approach to network design has been adopted by the global data networking vendors, albeit using slightly different approaches to this network segmentation challenge. This is especially important when utility companies adopt a "Cloud First", approach as part of their wider IT/OT networking strategy, something which is not

always easy to reconcile against their Information Security policies.

A recent Gartner Report on wired & wireless LAN access infrastructure highlighted that:

"By 2023 90% of enterprise campus networks will segment network attached devices into tunnels through role-based policies. Up from just 5% in 2019"

Realising the benefits of a modern network

In today's world, businesses grow and change at a pace that can be difficult to keep up with and utility organisations are no exception. If you are in charge of designing or operating the communications networks that enable your organisation, it is essential that your wired and wireless networks can readily adapt to change rather than impede it. Delivering network transformation does not have to be a daunting task when you approach it with technology that is designed to cope with the increased demands for wireless connectivity, security, and agility, whilst also reducing management complexity.

Configuring new users and applications

One of the greatest challenges in network management is the need to provide services for new users and applications that have specific security and connectivity requirements. The shift to hybrid working and the need to securely and wirelessly on-board employees working from home has highlighted the need to easily add thousands of new users to the network simultaneously. This is typically a largely manual process as complex configurations are required in each instance.

Modern network solutions address this problem by simplifying and automating the provisioning process into pre-defined roles and privileges, which reduces time to implement and eliminates the possibility of human error. This policy-driven automation is particularly important in the area of IoT devices and Wi-Fi access, where many thousands of instances can be required across the entire network estate.

Network simplification

Utility network infrastructure is typically complex because of the range and age of technologies deployed. This can be costly to operate and hamper the agility needed to respond to market and customer demands. Additionally, seamlessly integrating new technology can be challenging and expensive.

By introducing network orchestration and reducing complexity there is an immediate benefit in the efficient management of new devices, users, locations, services and applications. By automating workflows and harnessing analytics to optimize performance, internal management overheads are significantly reduced.

Future proofing

Today's network infrastructures are typically comprised of fixed elements including circuits, hardware, software, and wireless user devices, all overlaid by important security controls. This configuration presents a number of challenges; change requires significant effort, carries downtime risk and can be expensive. Moreover, once completed this infrastructure is still fixed, and any future changes require a repeat of the upgrade process.

This cycle can be broken by allowing continuous changes to be made in-life. This mitigates risk by automatically deploying upgrades, minimises human intervention and reduces the number of planned outages. Additionally, because device, user, location and application policies are clearly

user, location and application policies are clearly defined, future changes and additions are not only easier but are considerably more secure. In this way, the network transforms from a critical rigid asset to a flexible business enabler.

Maintel are experienced in transforming critical network infrastructures for utility companies and other large enterprises. We are deploying exciting new networking technology which meets the need to provide flexible, wired or wireless access to public or private cloud services, without compromising cyber-security.

Case Study: Water Company

By making investment decisions based on procurement process and price alone, this water company was left with a complex, siloed network comprising a large number of point solutions from different vendors. The complicated structure meant that when the contact centre was upgraded, the back office remained unsupported, creating vulnerability. The organisation needed a network that they could rely on and control. While they were initially cautious about opening up their infrastructure to externally facing public cloud services, a selective approach to service deployment preserved its integrity. Maintel are in the process of upgrading and migrating to a public cloud solution for this step of the project.

Legacy networking technical challenges

Innovation in the form of IoT devices, virtual reality, and augmented reality are all increasingly being used in utility organisations' infrastructures. Legacy networks were never designed to easily integrate so many new devices and can therefore no longer keep pace with this rate of technological change.

What is needed is more flexible, secure and automated communications networks, which can easily accept the range of new technologies which are being deployed. This networking technology is no longer theoretical – our solutions can help overcome some of the more common legacy infrastructure challenges and help provide a more flexible foundation for future innovation.

Complexity

Traditional networks are comprised of many different and separate protocols. These include Border Gateway Protocol (BGP), Open Shortest Path First (OSPF), Spanning Tree Protocol (STP) and Internet Protocol (IP). This complexity can make networks inefficient, undermine resilience and increase restoration time in the event of even a minor failure.

The modern enterprise demands secure, agile, scalable and resilient wired and wireless connectivity, without the complexity of traditional networking. With a simpler network, recovery times are faster, and increased interconnectivity means that the loss of a link or even a network device will not impact your applications.

Dispatching manual configuration to history

Traditional networking is largely configured manually, switch by switch, through a command line interface (CLI). This method was adequate in a static network. However, in today's environment where new devices and applications are moved, added, or changed frequently, manual configuration is time consuming. It also introduces the risk of an outage or even a security breach resulting from human error during a change.

Most network managers are now expected to deliver more wireless connectivity and enable network changes at an increasing pace. Many of these changes require a maintenance window, which introduces a service delivery delay. By automating network changes they can be made

in minutes, rather than days or weeks, and a centralised management system significantly reduces errors, and makes the network much more stable.

Vulnerability to breaches

Security concerns are front and centre in utilities today. For example, you don't want guest wireless devices to communicate over the same network as customer records systems. In legacy networks, this issue has traditionally required multiple virtual local area networks (VLANs) with access controls and firewalls to separate the traffic. However, if you are sharing a routing table, your IP network is flat and if someone breaches your network, they might be able to access sensitive data such as customer payment information.

Software Defined Networking (SDN) and fabric networks make securing your network simpler. Many methods of security are available including macro-segmentation, micro-segmentation, hyper-segmentation, and virtual routing and forwarding (VRF). All of these accomplish the segmentation of traffic across the network to add levels of security.

Having a network that can easily be segmented allows you to improve your overall security by dramatically reducing the attack vectors and limiting access to more sensitive areas of the network. In addition, service profiling ensures that potential back-door entry points are reduced by only enabling necessary access to information.

Network deployment and financing

Managing costs and ensuring operational efficiency is critical for any utility organisation. Replacing old technology with more effective alternatives can lower support costs, improve flexibility, and increase resilience. But this essential change can come with heavy capex requirements and require significant business disruption during execution.

During the past decade, 'IT infrastructure' and 'change' have become synonymous. Today's IT managers are expected to deploy network solutions that will provide full functionality and security into the next decade, however the flexibility to adapt on-demand is hampered by traditional purchase models.

To remain competitive, utilities need a way to invest in critical IT infrastructure that offers end-to-end flexibility while protecting valuable capital. Maintel can offer a subscription model that allows organisations to address their ever-changing needs with an Opex network-as-a-service offering. As a result, utilities now have access to a network acquisition model that provides the same level of flexibility and agility as other cloud-based services.

Organisations can refresh their network infrastructure or adjust capacity simply, without the need for high capital expenditure. As a result, they can continue to invest in scaling their business instead of their network infrastructure

Deployment assistance

Change initiatives can be challenging with numerous stakeholders and require careful project management. However, significant productivity gains are also possible with smaller change initiatives that are focussed on the problems or bottlenecks most affecting service delivery.

Whatever stage you are at in your network planning, help is at hand. Maintel has considerable experience of integrating and deploying innovative technology, to give utility organisations productivity gains as well as an improved service experience. From small to large projects, with our experience you can audit your current technology, define your network strategy and create a

practical deployment plan. As a cloud and managed services provider, Maintel will stay with you every step of the way from design validation, deployment, transition and into the future.

Improved business agility

Business priorities are constantly in flux. Over half of IT managers have found that their business's strategy has changed frequently in the last few years. Long term network commitments and equipment depreciation cycles leave some utility organisations struggling to react to these changes quickly enough. To help them keep pace, Maintel subscription services provide the ability to quickly adjust and adapt to new, different, and transitory circumstances.

Organisations no longer have to try to forecast the future. With network subscription, when business needs change, compatibility issues arise, or technology progresses, organisations can simply adjust their networks. Risk is significantly reduced because businesses have the ability to expand, contract, or refresh their wired or wireless network infrastructure.

Support every step of the way

From the moment new networking technology is deployed, utilities can rest assured that Maintel experts are always close at hand. We offer secure remote access, 24x7 telephone support, online support, and next day advanced hardware replacement, helping to ensure that support is available when organisations need it.

Conclusion

For too long organisations have been constrained by the fixed nature of their communications infrastructure with lumpy capex investments needed to keep up to date, and a reactive long-term strategy (or no strategy at all).

In almost all other areas of information technology the model has become consumption based and opex financed. The flexibility this brings to utilities is significant; speed of change, economically scaling with customer demand and the ability to avoid major change programmes delivers greater business agility.

By taking a consultative approach to identify the desired end goals and rolling backwards, each future system upgrade or replacement becomes an element of a long-term, large scale technology project that can take place 'as-a-service' or when limited capital expenditure becomes available.

Maintel's highly innovative technological and commercial models allow utilities to drive network efficiency, reduce cost and simultaneously improve customer experience, with one eye always on the future.

Whatever stage you are at in your planning cycle, the time is right to talk to Maintel along with our world class vendor partners in the IT & OT networking space.

Get in touch and learn more

Whatever stage you are at in your planning cycle, the time is right to talk to Maintel. Speak to us here.

Or for further information around Maintel, and how we partner with world class vendors to service the Utilities space, click here.