Direct Testimony and Schedules
Michael O. Remington

Before the Minnesota Public Utilities Commission
State of Minnesota

In the Matter of the Application of Northern States Power Company
for Authority to Increase Rates for Natural Gas Service in Minnesota

Docket No. G002/GR-21-678
Exhibit___(MOR-1)

Business Systems

November 1, 2021

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Schedules

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND OCCUPATION.

A. My name is Michael O. Remington. I am currently serving as the Business Systems Regulatory Director, Advanced Grid, for Xcel Energy Services Inc. (XES), the service company affiliate of Northern States Power Company, a Minnesota corporation (NSPM or the Company) and an operating company of Xcel Energy Inc. (Xcel Energy). I have been in my current position since January 31, 2021.

Q. PLEASE SUMMARIZE YOUR QUALIFICATIONS AND EXPERIENCE.

A. I am currently responsible for directing and preparing testimony, supporting documents, and discovery responses related to Business Systems in filings before the Minnesota Public Utilities Commission (Commission) as well as for other Xcel Energy operating companies (OpCos). I am also responsible for the regulatory aspects of Business Systems' role in the Advanced Grid Intelligence and Security (AGIS) initiative.

Overall, I have over 20 years of experience in the field of IT, which includes my career at Xcel Energy. After almost eight years at IBM Global Services where I filled IT roles under contract for Xcel Energy, I joined Xcel Energy in July 2008 as a Senior Manager of IT Service Management, where I served continuously for 11 years. My team was responsible for the administration of core IT service management processes (change, problem, request fulfillment, configuration and asset management). We also ensured compliance and audit readiness for several North American Electric Reliability Corporation (NERC) regulatory standards and Sarbanes-Oxley Act of 2002 controls. From October 2013 to January 2015, in addition to my role as Senior Manager of IT Service

Management, I served on temporary assignment in the General Counsel organization where I practiced law on behalf of Xcel Energy, including transactional work and equal employment opportunity and safety investigations. From July 2019 to January 31, 2021, I was Director of IT Operations. In that role, I was responsible for managing major incidents, monitoring Information Technology (IT) infrastructure and applications, disaster recovery planning, and managing several core IT service management processes.

My résumé is attached as Exhibit___(MOR-1), Schedule 1.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. I present and support the Company's capital and operation and maintenance (O&M) budgets during the 2022 test year for the Business Systems area.

Q. PLEASE PROVIDE AN OVERVIEW OF THE BUSINESS SYSTEMS AREA WITHIN XCEL ENERGY.

A. Business Systems provides IT services across Xcel Energy. Like all utilities, Xcel Energy must invest in computers, software, networks, mobile devices and other IT services each year in order to (among other things):

- Coordinate work in the field;
- Interact with customers;
- Run our gas system;
- Provide information to our state and federal regulators;
- Purchase gas;
- Bill and collect efficiently;
- Develop budgets and track expenditures;
- Manage vendors and vendor contracts; and

- Pay employees.

Each of these activities is necessary to provide reliable natural gas service and a positive customer experience.

Q. CAN YOU PROVIDE AN OVERVIEW OF THE WORK BUSINESS SYSTEMS WILL BE PERFORMING OVER THE NEXT FEW YEARS?

A. Yes. Over the next three years, Business Systems will continue much of our fundamental IT work, including replacing aging technology; protecting customers and the Company against cyber security risks and attacks; and strategically enhancing our IT capabilities to improve our customer and employee experiences.

This ongoing, fundamental IT work is necessary because technology changes constantly. With typical asset lives ranging from three to seven years (depending on the system), the average lifespan of IT assets is considerably shorter than it is for assets in many other business areas. Although we have been able to return great value from our larger systems, IT assets need frequent attention in order to keep up with changes in technology and corresponding changes in customer expectations. We will continue to be flexible and nimble, working within the resources available to us, to address new technologies and needs as they emerge.

With respect to replacing aging technology, we not only continue to focus on making sure our employees have the technology tools necessary for the provision of natural gas service to customers, but we invest in projects that will transform business areas. While some of these tools (e.g., desk and laptop computers, mobile phones, software versions) need to be patched, updated, or

replaced on a reasonably regular basis, in other areas we have been able to strategically harvest maximum value from older systems and delay investments.

In addition to keeping technology updated, we need to maintain the security of data belonging to our customers, our employees, and our business. Knowing that we will continue to identify new cyber security risks over the next several years, we must proactively make the necessary investments to ensure data security.

Moreover, we also have the opportunity to enhance our capabilities and become more efficient. As an example, in 2018 we implemented Blue Prism Process Automation in the financial operations area, which leverages automation technologies in order to streamline workloads. This helps ensure a better, more efficient, and faster financial close process by leveraging technology to maximize our employees' time.

Additionally, in an era when customers' expectations are higher than they have ever been, we are also focusing on enhancing our customers' experience with their utility service by leveraging data, as well as interactive technology through the web and digital interfaces, to improve our customers' options for usage and services. We are continuing on an enterprise-wide effort to advance and modernize the Xcel Energy customer experience, including updating existing systems such as our website and MyAccount through our CXT program.

Q. PLEASE PROVIDE A SUMMARY OF YOUR TESTIMONY.

A. In my Direct Testimony, I describe the Business Systems organization, as well as some of the IT and business continuity services we provide. I illustrate that

our capital and O&M investments have increased in light of the rising importance of IT in our business. I explain the kinds of investments we are currently making, why they are important to meet our customers' changing energy needs, and how we work to ensure reasonable costs for those investments.

I present our proposed capital additions of approximately $96.4 million for 2022 on an NSPM (Total Company) basis.[1] I provide support for the key investments we seek to recover in base rates during the test year.

I begin by walking through the major capital projects that comprise these rate case budgets, organizing projects according to the following budget groupings: (1) aging technology, (2) cyber security, (3) customer experience, (4) enhancing capabilities, and (5) emergent demand.

I then discuss the Business Systems O&M budget for 2022, which is driven primarily by Software License and Maintenance and Company Labor costs. I explain why our O&M budget is reasonable and reflects the types of expenditures we must make to keep the technology side of our business running productively.

Q. HOW HAVE YOU ORGANIZED YOUR TESTIMONY?

A. My testimony is organized into the following sections:

- *Section II* – Business Systems Overview

[1] All costs for capital additions in my testimony are stated on an NSPM (Total Company) basis, including gas and common unless otherwise noted. Capital projects that would be only assigned to the State of Minnesota Electric jurisdiction are not included. As discussed in more detail below, Business Systems O&M costs are presented for the NSPM Gas jurisdiction.

- *Section III* – Capital Investments
- *Section IV* – O&M Budget
- *Section V* – Conclusion

II. BUSINESS SYSTEMS OVERVIEW

Q. PLEASE DESCRIBE BUSINESS SYSTEMS' KEY ROLES AND RESPONSIBILITIES.

A. Business Systems is the Company's centralized IT organization, providing technology services across all operating companies, including NSP-Minnesota. These services include support for the following business operations:

- *Foundational Technology Infrastructure.* Business Systems is responsible for providing support for each employee's hardware and software needs. This includes maintaining and updating the operating system used on employee computers and providing sufficient data storage capabilities. Business Systems is also charged with protecting the security of the Company's data from cyber attacks.
- *Systems Controls.* Business Systems provides technology support to our natural gas distribution units to help manage and operate the gas systems. This includes providing and supporting software applications such as Supervisory Control and Data Acquisition (SCADA), which is used to monitor the health of the natural gas distribution systems.
- *Customer Support.* We provide support for infrastructure and software that facilitate interactions with our customers. This includes maintaining the Customer Resource System (CRS), which is the Company's customer information system of record, which generates approximately 4 million billing statements to Xcel Energy customers on a monthly basis. We also support the Interactive Voice Response (IVR) software that enables interaction with customers via telephone keypad or speech recognition.

Business Systems is also responsible for maintaining the technology used for the Company's website that provides valuable information to customers about their accounts and Company operations including outages.

- *Corporate Support.* We provide IT support for necessary corporate functions of the Company such as Human Resources and Financial Management. This includes providing and maintaining software applications that assist in the creation, tracking, reporting, and analysis of budget and forecast information.

Q. HOW DOES BUSINESS SYSTEMS SUPPORT THE SERVICES OR FUNCTIONS DESCRIBED ABOVE?

A. Along with our day-to-day work to support the IT we have deployed, Business Systems makes capital investments and incurs O&M costs to support other business areas and functions across Xcel Energy as discussed above. I will discuss our capital investments and O&M trends in more detail below.

Q. WHY IS BUSINESS SYSTEMS IMPORTANT TO THE COMPANY AND ITS CUSTOMERS?

A. Business Systems provides the technologies and supporting services necessary for system reliability and security, operational decision-making, and improved customer support and business capabilities. Technology is constantly advancing and evolving as a foundational aspect necessary to help any business meet its goals and objectives.

To operate in such an environment, we must be smart and proactive by identifying and integrating technologies that will both advance our business and protect it from technological attacks. For example, the advancements in two-

way communications, intelligent devices, and SCADA necessitate the integration of many systems to ensure effective use of information and enable operational capabilities of new technologies. Identifying new technologies and integrating them into our system supports smarter gas operations, system optimization, a more effective workforce with better-enabled employees, and more informed stakeholders through closer connections with external parties. These developments increase the importance of technology, and in turn Business Systems, to the Company and each of our stakeholders.

III. CAPITAL INVESTMENTS

A. Overview

1. 2018-2020 Business Systems Capital Additions

Q. WHAT WERE THE DRIVERS OF BUSINESS SYSTEMS' CAPITAL INVESTMENTS OVER THE PAST FEW YEARS, FROM 2018 TO 2020?

A. Over the past few years, due to the aging nature of our IT systems, changing business and regulatory requirements, and evolving technologies, the Company continued phased replacements and upgrades to the Company's systems.

Q. WHAT SYSTEM UPGRADES AND REPLACEMENTS HAS THE COMPANY UNDERTAKEN DURING THE 2018-2020 PERIOD?

A. We have continued to invest in routine aging technology refreshes as well as projects to address outstanding business needs, including cyber security and enhancing our capabilities. We have also significantly enhanced our focus on customer experience as changing customer expectations are requiring us to work to continuously improve and maximize the performance of the tools serving customers.

In addition, our aging network infrastructure was (and continues to be) a key driver of increased investment and requires attention on an ongoing basis. Network connectivity is a critical operational foundation required for the Company to provide a safe and reliable product. Failure to replace aging network mechanisms would increase the risk of component level failures resulting in systemic outages across service venues.

Significant specific Business Systems aging projects included replacement of aging network components and the Microsoft Next Generation project (a major Microsoft Windows operating system upgrade from Windows 7 to Windows 10), which required entensive application testing and in some cases application upgrades. This is because upgrading operating systems is complex and generally requires extensive testing of current applications that run on an operating sytem to ensure compatibility with the new operating system and in many cases requires application upgrades (if available) to ensure applications run well with the new operating system, if not to ensure outright compatibility. This required coordination with our vendors and across platforms and software to ensure our systems would function as intended when we moved to Windows 10. In addition, upgrading to Windows 10 required that we refresh our network infrastructure.

Q. WHAT WERE THE BUSINESS SYSTEMS ACTUAL CAPITAL ADDITIONS FOR THE YEARS 2018-2020?

A. The 2018-2020 capital investments that the Company made are provided below in Table 1 and Figure 1.

Table 1

2018-2020 Actual Capital Additions

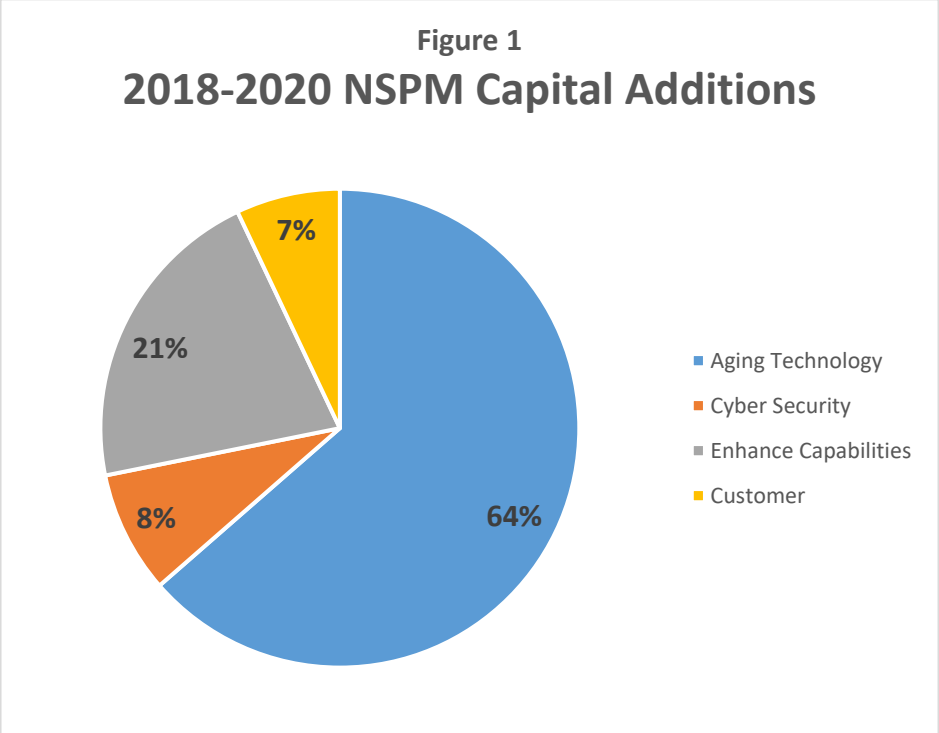
(Dollars in Millions)

Capital Category	2018	2019	2020
Aging Technology	$49.9	$63.8	$50.4
Cyber Security	6.4	4.5	9.4
Enhance Capabilities	20.0	28.9	3.7
Customer	-	-	17.2
NSPM Total	**$76.5**	**$97.2**	**$80.6**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

Figure 1

2018-2020 NSPM Capital Additions



Q. CAN YOU EXPLAIN WHY THE AMOUNTS OF INVESTMENT IN THESE CAPITAL BUDGET GROUPINGS VARIED OVER THESE THREE YEARS?

A. Yes. Our investments vary year over year depending on the needs of existing technology systems. In 2018, capital additions were significantly lower than in the immediate prior years. In the prior years, one of the most significant recent undertakings in the Business Systems area was the development of the new General Ledger (GL) and Work and Asset Management (WAM) system as part of our Productivity Through Technology (PTT) initiative, which was its own budget grouping at the time, highlighting the significance of that initiative. The majority of the investments in the GL were undertaken in 2014 through 2015, with some preliminary work in 2013 and some post-implementation follow-up in early 2016. The GL was placed in service at the end of 2015. Most of the WAM implementation work was completed and placed in service by the end of 2017.

In 2019, there were several large project additions that drove up investment in aging technology and enhancing capabilities, including the NSP-MN System Replacement project $14.4 million, the Microsoft Next Generation project $8.0 million, and the Enterprise Service Bus (ESB) $7.8 million.

In 2020, while we continued work to refresh our aging technologies, upgrade our cyber security capabilities, and enhance the Company's capabilities, we also began significant investments in the customer experience area, which got underway in 2019. In Section III.B and III.D.4, I describe in more detail the work we have completed so far in this program and the work we look forward to implementing during the 2022 test year.

Q. DO YOU HAVE ANY OTHER COMMENTS RELATED TO THIS CAPITAL INVESTMENT HISTORY FOR 2018-2020?

A. Yes, I have a few comments related to how these numbers might compare to future budgeted amounts. First, as we continue to turn to initiatives including the customer experience mentioned earlier, we will continue to see a portion of our resources dedicated to those areas. Additionally, as I will discuss later, Emergent Demand dollars are ultimately invested to support other categories' capital projects, and therefore appear as capital additions under those categories (rather than in Emergent Demand) for prior years. Finally, I will discuss below how the Company is investing in enhancing capabilities in order to better serve our customers and mitigate increases in O&M expenses.

Q. LOOKING AT THIS HISTORY, WHAT DO YOU CONCLUDE?

A. Business Systems' prior capital investments have supported the technologies needed to provide gas service to our customers. Without ongoing investment in technologies, we would lack the tools to operate reliably and securely, support functional decision-making, enable communications and "smart" resources, and protect such fundamentally important resources as our gas operations, our customer information, and our financial data.

Q. MOVING FORWARD, CAN YOU ADDRESS BUSINESS SYSTEMS' CAPITAL WORK IN 2021 SO FAR?

A. Yes. We have continued to invest in routine replacements as well as projects to address outstanding business needs, with a focus on customer experience. Customer experience investments will continue to be a focus for the next several years, as changing customer expectations are requiring us to work to continuously improve and maximize the performance of the tools serving

customers, albeit with declining implementations during the 2022 test year as the major foundational investments are implemented in 2021 into 2022, with certain continued specific implementations with defined outcomes to build out transformational customer experiences.

Q. ARE THERE ANY NOTABLE INDIVIDUAL BUSINESS SYSTEMS PROJECTS OCCURRING IN 2021?

A. Other major investments in 2021 include Annual Refreshes and Digital Operations Factory enabling capabilities. The Digital Operations Factory is a cloud-based, modern data and analytics platform that will enable the Company to make better use of available data to enhance both customer journeys and core operational processes. This project will deliver a secure multi-tenant cloud platform as a foundational engine for each of the following capabilities: reusable data lake; common integrations; analytics workbench; mobile platforms; dashboard framework, and artificial intelligence models. Once the foundation is built, the project examples include predictive modeling, real time scheduling systems, operations work management, routing and screen of data, work dashboards, and profiles.

In addition, in 2021, there is a $4.1 million Gas Plant SCADA Delta V Replacement capital addition included in the Business Systems budget. The main goal of this project is to replace the outdated, existing Gas SCADA systems at the Westcott, Sibley, and Maplewood Gas plants. The existing software was at the end of its useful life and and upgrade of software is required to provide control and operational system controls. Company witness Ms. Mary P. Palkovich provides additional support for these gas plant investments, and

otherwise supports capital investments required to ensure safe and reliable gas service delivered by Xcel Energy's peaking plants in Minnesota.

Q. HAS THE COVID-19 PANDEMIC AFFECTED BUSINESS SYSTEMS CAPITAL INVESTMENTS IN 2020 AND BEYOND?

A. Yes. COVID-19 has impacted Business Systems' priorities by requiring us to prepare staff to work remotely, necessitating increased network support and new work-at-home tools, and by thinking differently for projects that require in-person testing. In some cases, as with other business changes, this has required us to implement projects differently and/or has resulted in some minor delays. Of course, traveling was also reduced due to new Company restrictions. The Business Systems area has updated our financial budgets for 2021 and beyond to reflect our best estimate of these financial impacts, and will continue to adjust as more COVID-19 information is available. This is consistent with the approach we would take related to any of the various ways our business may evolve during a given period.

2. Overview of the 2022 Test Year

Q. WHAT IS YOUR CAPITAL ADDITION FORECAST FOR 2022 BY CAPITAL BUDGET GROUPING?

A. Our capital addition forecast by budget grouping for 2022 is set forth in Table 2 and Figure 2, below. Individual project capital investment additions are also listed in Exhibit___(MOR-1), Schedule 2.[2] The total $96.4 million represented below is NSPM total Company. Of the total amount identified in the table

[2] In some cases, rounding may result in a slight variation between some tables and Exhibit___(MOR-1), Schedule 2.

below, a total of approximately $7.7 million is allocated or assigned to the Minnesota gas jurisdiction for 2022.

Table 2

2022 Capital Additions

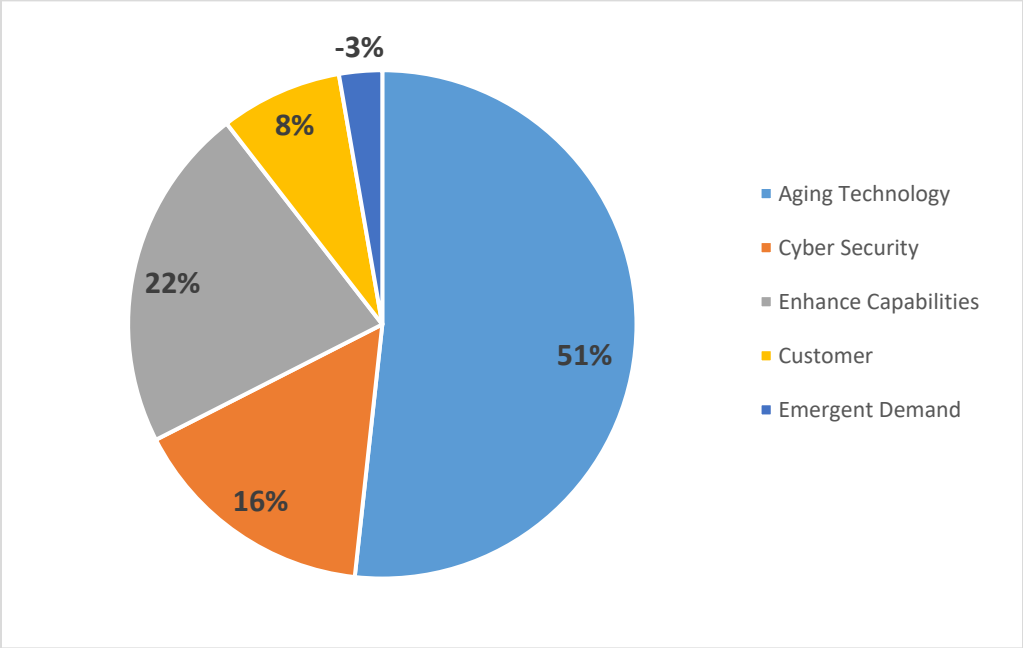
(Dollars in Millions)

Categories	2022
Aging Technology	$52.7
Cyber Security	16.1
Enhance Capabilities	22.4
Customer	7.9
Emergent Demand	(2.8)
NSPM Total	**$96.4**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

Figure 2

2022 NSPM Capital Additions



Q. WHAT KEY PROJECT AREAS WILL THE COMPANY INVEST IN DURING THE 2022 TEST YEAR?

A. As illustrated by Table 2 and Figure 2 above, Business Systems is devoting significant resources to address aging technology, enhancing capabilities, and cyber security initiatives. We are also continuing to manage for emerging needs.

Our aging network infrastructure continues to be a key driver of increased investment and requires attention on an ongoing basis, which as I previously indicated is a critical operational foundation required for the Company to provide a safe and reliable product. In addition, we continue to seek out areas that will enhance the Company's capabilities to provide value to our customers. I will discuss these efforts in more detail later in my testimony.

Q. CAN YOU PROVIDE AN OVERALL PICTURE OF YOUR CAPITAL ADDITIONS AND CAPITAL EXPENDITURES TRENDS FROM 2018 THROUGH THE END OF THE TEST YEAR (2022)?

A. Yes. Our overall 2018 through 2022 capital additions and capital expenditures are set forth in Tables 3 and 4 below.

Table 3

2018-2022 Capital Additions

(Dollars in Millions)

	2018 Actual	2019 Actual	2020 Actual	2021 Actual/Forecast	2022 Forecast
Aging Technology	$49.9	$63.8	$50.4	$75.1	$52.7
Cyber Security	6.4	4.5	9.4	15.1	16.1
Enhance Capabilities	20.0	28.9	3.7	38.3	22.4
Customer	-	-	17.2	41.7	7.9
Emergent Demand	-	-	-	(4.3)	(2.8)
NSPM Total	**$76.5**	**$97.2**	**$80.6**	**$165.8**	**$96.4**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

Table 4

2018-2022 Capital Expenditures

(Dollars in Millions)

	2018 Actual	2019 Actual	2020 Actual	2021 Actual/Forecast	2022 Forecast
Aging Technology	$43.3	$46.0	$57.1	$56.6	$55.3
Cyber Security	5.1	7.5	8.2	14.0	14.6
Enhance Capabilities	24.6	19.6	16.2	33.2	32.4
Customer	-	9.7	20.2	27.4	6.4
Emergent Demand	-	-	-	(13.8)	9.4
NSPM Total	**$73.0**	**$82.7**	**$101.7**	**$117.4**	**$118.1**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

Tables 3 and 4 illustrate that Company investments in IT vary depending on the specific work that is necessary for our business and our customers in a specific year. In the years when less investment is needed, we budget accordingly, and Company resources are used where they may be required in other business areas. Conversely, Business Systems capital expenditure levels necessarily increase in years when we are embarking on significant initiatives, and capital additions necessarily increase when those initiatives are placed in service.

Q. WHY DO CAPITAL ADDITIONS TOTALS DIFFER FROM CAPITAL EXPENDITURE TOTALS?

A. While the capital addition trend is directly affected by our capital expenditures, the capital additions (plant in service) trend may not mirror the capital expenditure (spend) trend and may fluctuate more depending on the length of time individual projects require to complete. The capital expenditure trend reflects the progress of the project through the months, whereas the capital addition trend reflects the total at the conclusion of the construction or implementation process when the asset is placed in service. Company witness Ms. Laurie J. Wold addresses how the Company's overall capital additions align with budgeted capital additions in any given year.

Q. WHAT MAJOR CAPITAL PROJECTS ARE DRIVING THE COMPANY'S 2022 TEST YEAR REQUEST?

A. As shown Table 5 below, we anticipate undertaking five major capital projects in 2022 . These capital additions include:

Table 5

2022 Major Capital Projects

(Dollars in Millions)

Project	2022
Annual Refresh	$14.4
EXT Mobile Application Development	8.5
DR Technology Refresh	5.0
Infrastructure Modernization	5.0
CXT Budget	4.2
NSPM Total	**$37.1**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

I describe these projects in more detail in Section III.D of my Direct Testimony.

3. Challenges Facing the IT Business Area

Q. ARE THERE CHALLENGES UNIQUE TO BUSINESS SYSTEMS THAT CAN AFFECT THE COMPANY'S BUDGETING AND ACTUAL EXPENDITURES?

A. Yes. Technology changes constantly. As a result, issues with older software or equipment may not seem critical during budget creation but become critical if systems begin to show signs of issues or failure, or no longer serve their intended purpose. Additionally, cyber security threats are constantly in flux and may result in additional investment in a given year to ensure that cyber security tools and resources are responsive to new threats to our information systems. As IT has become increasingly critical to the business, the demand for IT solutions and fixes far outpaces the dollars available to meet those requests. As a result, it is necessary to constantly monitor, and sometimes re-prioritize, the percent of total dollars invested in each capital budget grouping.

Q. WILL BUSINESS SYSTEMS STILL MANAGE ITS OVERALL CAPITAL INVESTMENTS TO ITS OVERALL BUDGET?

A. Yes, it will. Our overall budget supports our investments in technologies and supporting services as necessary to ensure system reliability and security, to facilitate operational decision-making, and to provide the necessary levels of support to our customer support and business capability functions. Business Systems is expected to manage its capital additions to its capital budget once that budget has been developed, fully-vetted, and approved, as I discuss in Section III.C.

Q. ARE THERE ANY OTHER BUSINESS TRENDS THAT YOU WOULD LIKE TO DISCUSS?

A. Yes, just briefly. As the technology landscape continues to evolve, cloud computing is becoming a more common way for companies to provide IT services. This presents unique decision-making requirements as we look to future IT solutions, and can also present financial challenges because some cloud solutions might be treated as O&M whereas the same solution would be capitalized when owned by the Company.

Q. WHAT ARE THE POTENTIAL BENEFITS OF CLOUD COMPUTING?

A. In some cases, there may be cost benefits associated with transitioning to cloud computing because third-party service providers can offer pricing that is leveraged across many customers since costs of operating and maintaining servers would be shared among many parties utilizing cloud services. Additionally, cloud computing benefits may also include having the most up-to-date technology available, allowing for more seamless, regular upgrades that are less disruptive to business operations, affording more scalability and flexibility as Company needs change to meet Company and customer needs,

and could bring increased security.

Q. HOW WILL THE COMPANY MAKE THE TRANSITION TO INCREASE UTILIZATION OF CLOUD COMPUTING?

A. The Company will need to continue to create a decision framework to identify when leveraging cloud technology may improve business objectives, productivity, and the customer experience.

Q. WHAT IS THE FINANCIAL TREATMENT OF HOSTED SOLUTIONS?

A. When capital policy requirements are met, the Company will capitalize a hosted solution in a similar way as an on-premises solution. In other scenarios, the on-pemises storage is capital because the Company effectively takes ownership of the hardware and/or code, while others are O&M when they do not meet the Company's capitalization requirements. The general terms of the Company's capitalization policy are discussed by Ms. Wold in her Direct Testimony.

Q. WHAT DO YOU CONCLUDE ABOUT BUSINESS SYSTEMS' 2022 CAPITAL INVESTMENT FORECAST?

A. I conclude that our capital forecast represents an accurate, reasonable, and representative picture of our IT investments. History demonstrates that the Company will make the investments necessary to serve customers safely and reliably. Therefore, this forecast can be relied on to set just and reasonable rates for our customers.

B. Business Systems Investment Needs

Q. WHAT ISSUES ARE DRIVING BUSINESS SYSTEMS' STRATEGIC CAPITAL PLANNING?

A. As I discussed above, the five key areas driving IT investment going forward are: (1) replacing aging technology; (2) addressing evolving cyber security threats and requirements; (3) enhancing capabilities; (4) enhancing the customer experience; and (5) addressing emergent demands. I discuss each of these areas below. I will also explain how we are addressing emergent demands in the next section, Project Budgeting and Governance.

1. Aging Technology

Q. WHAT ARE THE PRIMARY ISSUES FACING THE COMPANY WITH REGARD TO AGING TECHNOLOGY?

A. Business Systems supports the operations of the Company with a large and growing IT infrastructure. Information assets are no different from physical assets, although IT assets have generally shorter lives. They are subject to aging, technological obsolescence, and increasing maintenance costs. Business Systems not only completes routine annual refreshes of technology, like replacing computers and printers, but also plans and places in service large IT projects that modernize the Company's IT and address the needs and experiences of our customers and employees. A reasonably up-to-date infrastructure is necessary for the Company to continue to meet increasingly demanding data security, reliability, and compliance requirements, as well as the service expectations of our customers. For example, some aging technologies are not equipped with the most current data security measures, meaning they are more vulnerable to cyber attack. In addition, the recovery of aging technologies after an outage can be compromised if those systems are no longer supported by their vendor.

Replacing or upgrading aging IT also affords the Company the opportunity to take advantage of certain enhancements or efficiencies of more modern IT, such as automating previously labor-intensive processes in order to reduce labor costs and other employee expenses, such as travel time. Other upgrades make our systems more secure, make them more consistent with existing IT across the Company, or are implemented to maintain compliance with regulations.

Another area of IT that must keep pace with current needs is our Company's data storage capabilities. The increasing use of technology across the organization is resulting in the need to store, transmit, and manage ever larger amounts of data, and our systems must be able to keep up with these growing data storage needs. While solutions such as routine information purging and data warehousing can help reduce the impact of this data "explosion," they are not sufficient to fully mitigate it. As a result, we need to increase our storage capacities and the speed and flexibility of our networks, and improve our tools to cost effectively manage our data and information.

Q. HOW DOES THE COMPANY DETERMINE WHEN EXISTING IT NEEDS TO BE REPLACED?

A. Business Systems strives to maximize our technology investments by maintaining existing software and hardware until the risk and costs associated with keeping these aging technologies in place require attention. For instance, new software systems are often necessary when the existing software is no longer supported by the vendor.

2. Cyber Security

Q. PLEASE SUMMARIZE THE CYBER SECURITY ISSUES FACING THE COMPANY.

A. There are four key cyber security issues the Company must address: (1) keeping hackers out of our systems; (2) detecting hackers if they attempt to gain access to our systems; (3) removing hackers that gain access to our systems; and (4) returning our systems to their original state if hackers gain access. As the number of cyber threats, attacks, and regulatory requirements continues to increase in volume and complexity, it is imperative that the Company establish and maintain the proper tools to protect the integrity and confidentiality of our data and our systems. Given the unpredictability of these threats, it is important that these tools and resources continue to change in response to new threats to our information systems.

It is important to note that cyber security is not simply a matter of implementing a standardized base of security controls and processes that cover all the regulatory and legal requirements. Effective cyber security also requires filling the security gaps that would exist if we focused solely on regulatory and legal compliance. Many large financial companies that have had their data hacked in recent years were compliant with regulatory and legal requirements.

Q. WHAT IS BUSINESS SYSTEMS DOING TO ADDRESS THOSE CYBER SECURITY ISSUES?

A. The Company has taken great strides to address cyber security issues. This includes creation of a dedicated Enterprise Security and Emergency Management (ESEM) business area. The purpose of the ESEM is to enable the Company's vision, mission, and goals by proactively leading efforts to identify, protect, detect, and respond to all-hazard threats and events. The ESEM

oversees all aspects of security, which includes: cyber, physical, and personnel; investigations and digital forensics; threat management; privacy (customer and employee); and enterprise emergency management. There are multiple ways that the ESEM addresses new threats and solutions to cyber security issues.

First, ESEM exists to manage our overall cyber security posture, implement processes and plans to be able to quickly mitigate any adverse events, respond appropriately and effectively to large scale events that would otherwise cause significant harm to natural gas delivery systems, and ensure regulatory compliance.

Second, to meet the needs and demands of today's security requirements, Business Systems has implemented multiple security systems and technologies. We have implemented technologies to date that include: Vulnerability Management; Advanced Threat Protection; Security Forensic tools' Advanced Firewalls' Intrusion Prevention Devices; and a Security Incident and Event Management system to correlate all the data and bring visibility to what is happening on our infrastructure.

Third, we have enhanced our partnerships with both regulatory and state and federal agencies to ensure we are tapped into the stream of information available regarding impending threats and attacks. These associations and agencies include Edison Electric Institute, National Infrastructure Advisory Council, American Gas Association, the Federal Bureau of Investigation, and the U.S. Department of Homeland Security.

Finally, our disaster recovery team works with application support teams to

validate their disaster recovery plans on an annual basis. We have also implemented an isolated infrastructure and computing platform to enable thorough physical testing of recovery plans for certain critical applications, such as those running on the SAP platform, to ensure full recoverability.

3. Enhancing Capabilities

Q. HOW DOES BUSINESS SYSTEMS ASSIST IN ENHANCING CAPABILITIES FOR THE COMPANY?

A. Technology can offer the opportunity to improve productivity, enhance communications between systems and between people, and use data more efficiently. As an example, mobile phones were not necessarily invented to solve a problem with land-based telephone lines or service. However, as they emerged and became increasingly sophisticated, they have changed our society. We have needed to adapt and learn how to derive as much efficiency as possible from what have become wireless mobile computing devices. Business Systems must constantly evaluate new technologies to help the business areas increase efficiencies and enhance communications between systems that benefit the Company and our customers.

Q. HOW DOES BUSINESS SYSTEMS DETERMINE WHICH CAPABILITY-ENHANCING TECHNOLOGIES TO IMPLEMENT?

A. The key is to identify new technologies and to implement only those technologies that can offer efficiency benefits that outweigh their implementation costs. Business Systems works prudently with various business units to evaluate new technologies to determine whether they can be used to improve efficiency in the way tasks are completed, data is used, or in the way

communications are conducted within the organization and with external stakeholders, including our customers.

Q. HOW DO YOU DIFFERENTIATE BETWEEN ENHANCE CAPABILITIES INVESTMENTS AND THE AGING TECHNOLOGY INVESTMENTS?

A. Due to the nature of certain IT investments, some investments overlap between categories. That said, the projects in the Aging Technology category typically involve the replacement of assets that were already in service, while the projects in the Enhance Capabilities category typically involve implementing systems that are new applications or application modules that add to business capability or efficiency. When applications are upgraded, business judgment is necessary to determine which categorization is most appropriate.

4. Customer Experience

Q. WHAT IS XCEL ENERGY REFERRING TO WHEN IT DISCUSSES A "CUSTOMER EXPERIENCE"?

A. The customer experience refers to the Xcel Energy customer's direct interactions with the Company, whether by digital platforms, through the call center, in person, or otherwise. To manage that experience, we must have in place both system tools and customer interfaces that work for the customer, supporting their satisfaction with our service and their overall experience with our company.

Q. PLEASE DESCRIBE EFFORTS BY THE COMPANY TO ENHANCE THE CUSTOMER EXPERIENCE.

A. Over the last few years we have needed to focus on updating our primary customer touch points and relationship management tools. In support of the

enterprise focus on enhancing customer experience, we launched a new Customer Experience Transformation (CXT) program in April 2019 to help create smarter and simpler experiences for our employees and customers. This multi-year effort is designed to simplify our technology, transform customer experiences, improve customer satisfaction and employee engagement, and continue to drive more efficient operations. Since launch, the CXT program has been the primary driver and focus of customer experience capital additions.

In order to better describe these capital implementations given their significance to Business Systems work, the Company has described these additions in a separate, customer experience category, apart from aging technologies, enhancing capabilities, and cyber security work. Implementation of the foundational investments of the CXT program will primarily be completed by the end of 2021; however, we continue to implement individual components with defined outcomes that will build out the CXT program and create new experiences for our customers. Thus, the Company will continue to build on foundational investments with individual components that will drive specific customer experiences, whether it is interactions with the Company's website, MyAccount, our mobile applications, or other areas. Our work in developing and implementing the CXT program continues to drive how we think about enhancing the customer experience; therefore, I describe this effort in more detail in this section of my Direct Testimony.

Q. OVERALL, WHAT IS THE CXT PROGRAM?

A. CXT is a program developed to work strategically on enhancing our digital channels, developing a data fabric model and migrating our customer and business data into the model, and designing, building, testing, and deploying the

foundational components to allow the first two to operate. More specifically, we are utilizing more modern technologies that our customers have come to expect through experiences with other companies. This includes interactive websites, account management options, and smart phone applications.

As we utilize more modern technologies for our customers, we will simultaneously need to invest in new capabilities like data science, user design, and development. We are also utilizing our employees' innovative thinking to align with our customers' needs and expectations.

Q. WHY IS IT WORTHWHILE TO INVEST IN MEETING THESE NEEDS NOW?

A. In today's evolving technology market, utility customers' expectations are not set exclusively by utility companies; rather, high expectations are being set by companies like Google, Apple, and Amazon, who show customers what is possible and lead them to expect responsive, integrated, and problem-solving interactions with their service providers. Living in an era where customer's expectations are higher than they have ever been, the Company must be prepared to meet our customers' needs to remain a trusted provider of their energy services.

Q. WERE THERE BARRIERS TO MEETING THESE CUSTOMER NEEDS AND EXPECTATIONS UNDER THE COMPANY'S PREVIOUS CUSTOMER-FACING PLATFORMS?

A. Yes. Prior to implementing the CXT program components, our systems were not designed to be a customer relationship management system. Our legacy systems handled a significant volume of transactions on a daily basis and, over time, the amount of data that they store and manage builds and increases. The

number of systems that they had to interact with had grown as well, as illustrated in the left-hand side of Figure 3 below (visually demonstrating the previous state to current/future state). As a result, those interconnected systems had to work harder in order to stay reliable and responsive. As those systems were implemented and their connections built along the way, the integration and data technologies required to efficiently build out a more layered architecture in a cost-effective manner were not available, which created risk of system failure that could impact billing and payment operations, for instance.

An improved architecture as a result of CXT, shown on the right side of Figure 3, allows us to offload the pressure that has been placed on those applications and the information they contain. The architecture allows us to organize and centralize relevant data so that it can be used in multiple ways without directly impacting them. In doing so, we simplify access to information and will be prepared to efficiently support increasing customer, business, and security demands.

Figure 3

Q. HOW DID XCEL ENERGY IDENTIFY THE NEED FOR IMPROVEMENTS IN THE COMPANY'S DIGITAL INTERACTIONS WITH CUSTOMERS.

A. Across Xcel Energy, we continuously capture customer feedback regarding their interactions with us to understand if we are meeting their needs and where we should focus to improve the customer experience. In 2016, we implemented a new customer experience measurement practice that is centered on capturing customer satisfaction on key customer service channels including our contact center, website and our mobile app.

One of the key takeaways is that customers expect a seamless and simple interaction and that our digital platforms (such as our website, MyAccount, mobile app, and Customer Connection) are falling short of expectations. Customer satisfaction is low and/or has declined at the same time customer satisfaction with non-digital forms of interaction (contact center agents, IVR, and email correspondence) remains very high. We particularly noted declining satisfaction with respect to our billing and payment platforms, as well as new customer digital interactions and outage response digital communications. A September 2019 report on this data is attached to my Direct Testimony as Exhibit___(MOR-1), Schedule 4.

Q. WHAT AREAS RELATED TO UTILITY SERVICE ROSE TO THE TOP OF THIS ANALYSIS?

A. We identified that we could improve the customer experience in a timely manner, with high value to customers and reasonable complexity and cost levels by focusing on the following three areas: (1) Customer Assistance (Get Help) platforms, including making it easier for customers to find information on their services, usage, billing and payment, as well as the ability to have multiple

channels to address their needs, such as MyAccount, the Company website (xcelenergy.com), and Xcel Energy mobile applications; (2) Service Initiation (Start Service), which relates to starting electric or gas service; and (3) Electric vehicle (EV) support. CXT primarily relates to (1) and (2).

Q. WHAT WORK DID THE COMPANY ULTIMATELY DETERMINE IS NECESSARY TO IMPROVE THE CUSTOMER EXPERIENCE IN TODAY'S UTILITY LANDSCAPE?

A. The initial CXT program is, ultimately, a series of foundational investments in platform infrastructure and data analytics and automation that are intended to improve the Company's digital interfaces with customers. Recognizing that additional work will likely be needed and that customers will need to acclimate to changed interfaces with the Company, initial work and investments to improve the customer experience were divided into certain project areas: (1) Digital Channel Platforms (including MyAccount, the Company's website, Xcel Energy mobile applications, and new customers and real estate developers' initial connections with the Company (Customer Connect)); (2) the Customer Relationship Management (CRM) Platform (currently Salesforce); (3) Platform Infrastructure and Technology Maintenance; and (4) Data Analytics and Automation. Most of this foundational work will be completed by 2021, but CXT program work will continue, with additional components being placed in service in the future to build on the foundational work and continue to enhance customer experiences.

Q. WHAT PROGRESS HAS THE COMPANY MADE ON THIS INITIATIVE TO DATE?

A. We approached this program in phases, with initial deployments occurring in 2020 and continuing throughout 2021 into 2022. Xcel Energy has now deployed the technology foundation in which new experiences are being built

upon, including services like new customer connections and our service channels. Additionally, a new experience has been launched for Building and Remodeling customers, which streamlines the builder's interaction with Xcel Energy when requesting service to a new home or development.

Specifically, through 2021 we have achieved the following:

- Designed, built, tested and deployed the cloud-based infrastructure for our web-based applications and data grid;
- Designed, built, tested, and deployed our data grid infrastructure and began the migration of data;
- Began the implementation of our Salesforce infrastructure;
- Designed, built, tested, deployed our new customer connection application;
- Built a series of integration points between our legacy applications and our new environment;
- Built a set of automaton testing tools to expedite our deployment of future applications in this space;
- Updated our content on our FAQ pages;
- Built out, enhanced, and redesigned several components of our customers' digital interactions with the Company, and has included enhancing and modernizing Xcel Energy's customer-facing online digital platforms and underlying technologies, MyAccount, our mobile application, and website, www.xcelenergy.com;
- Built out our Contact Center capabilities with IVR technology;
- Built out outages and notifications experiences to provide more accurate and timely outage information and restoration information and to

provide new capabilities within the CRM platform; and Built out the existing CRM platform (Salesforce) to better serve our customers with a redesigned platform with new modules, including new Customer Identity and Access Management (CIAM) work, which enables single sign-in customer access and identity management to support MyAccount and Mobile App login (and other products).

Q. LOOKING FORWARD, WHAT CONTINUES TO BE THE FOCUS OF THE CUSTOMER EXPERIENCE?

A. Certain foundational work continues, and I explain below our "single screen" work that will help our employees more productively and efficiently assist our customers. In addition, we look to upgrade our CRS application overall and with certain components as part of the CRS Tech Stack, which is included among our smaller projects. Significantly, we look to develop program interfaces that will relieve pressure on our core systems with new data layers and capabilities, which will afford more flexibility and capacity for our core systems.

C. Project Budgeting and Governance

1. Methodology for Establishing a Reasonable Overall Budget

Q. HOW DOES THE BUSINESS SYSTEMS AREA ESTABLISH A REASONABLE CAPITAL BUDGET FOR A GIVEN YEAR?

A. The appropriate annual capital budget for Business Systems is based on a partnership between corporate management of overall finances and the business needs we identify. Company witness Ms. Melissa L. Ostrom explains how the Company establishes overall business area capital spending guidelines and budgets based on financing availability, specific needs of business areas, and overall needs of the Company.

The Business Systems area itself employs a "bottom-up" approach to planning for the needs our business area addresses. Business Systems will continue to use a portfolio prioritization and balancing process to determine the needs we must address and decide how to allocate limited funds according to the highest business priorities, including the greatest demands our IT systems face in each year. The portfolio is regularly prioritized and balanced to support established strategic objectives using predefined portfolio management criteria, the organization's desired risk profile, portfolio performance metrics, and capacity constraints. These projects are then rolled up to total budgeted costs by capital budget groupings. Often the desired initial budget exceeds the spending guidelines, which then requires review meetings with managers, directors, and vice presidents to assess the requested budget and determine the right course of action.

Because this happens throughout the Company, a higher or lower percentage of the Company's overall resources may be allocated to Business Systems in any given year, depending on the priority of needs throughout the Company. Ultimately, corporate leadership determines the amount of money to be allocated to Business Systems for each year, as part of the total budget development for the Company.

Q. HOW DOES BUSINESS SYSTEMS MANAGE ITS BUDGETED PROJECTS TO THE OVERALL CAPITAL BUDGET ALLOTTED TO IT?

A. Once the Business Systems allotment is known, Company leadership has final approval for either maintaining the portfolio "as is" or adjusting the portfolio within the established budget thresholds as part of a formal Technology Investment Governance (TIG) process. The purpose is to determine whether

the projects included in the budget are sound, viable, and worthy of funding, support, and inclusion in the Company's IT portfolio. The process of adjusting the portfolio may include:

- adding new projects that have been selected and prioritized for inclusion in the budget;
- identifying projects that are not authorized based on the review process; or
- eliminating projects to be suspended, reprioritized, or terminated based on the review process.

The TIG process and its "Gated" approval procedures are presented in more detail in Exhibit___(MOR-1), Schedule 5.

2. Changes in Planned Projects

Q. AS A PROJECT MOVES THROUGH DEVELOPMENT, DOES BUSINESS SYSTEMS TAKE STEPS TO MONITOR VARIANCES BETWEEN ITS ACTUAL EXPENDITURES AND ITS BUDGET?

A. Yes. In each key area of Business Systems, management monitors actual versus budget expenditures for both capital and O&M on a monthly basis. Any deviations are then evaluated to determine whether costs are appropriate. In addition, action plans are developed to mitigate variations in actual to budgeted expenditures. These mitigation plans may either reduce or delay other expenditures to support the overall authorized budget. If authorized budget adjustments are required, they are identified and approved at an appropriate level of management.

Q. DOES BUSINESS SYSTEMS ALSO ENCOUNTER TIMES WHEN IT MUST CHANGE PROJECT PLANS?

A. Yes. For some projects, the complex nature of the project implementation and long lead times mean we must plan for the project and carry it out over a long period of time. In these situations, we may need to adjust project cost expectations, timelines, or scope as the details and design of the project become more certain over time.

Other projects may have shorter lead times, a lower priority, or other reason why they are important but could be delayed if a higher priority comes to light. However, we remain obligated to manage to our budget and use the TIG process to re-prioritize projects within a year to stay within our overall budget.

Q. IF PROJECT PLANS NEED TO CHANGE, DO CHANGES IN PROJECT METRICS PRIOR TO IN-SERVICE REQUIRE APPROVAL FROM THE TIG PROCESS?

A. Yes. Any change to the budget, schedule, or scope of a project must be approved by the TIG process to ensure that the change is necessary and well-documented and brought forward to TIG process leadership.

We must seek approvals in addition to the TIG process, including possibly Corporate Governance approval, if costs of larger projects exceed certain pre-approved levels.

Q. PLEASE EXPLAIN THE PROCESS TO ACCOMMODATE NECESSARY UNFORESEEN CAPITAL INVESTMENTS THAT OCCUR DURING THE PLANNED CAPITAL INVESTMENT YEAR.

A. We utilize the portfolio prioritization and balancing process to evaluate new demand or changes to existing project budgets and determine the most appropriate course of action. Newly identified projects must still proceed through the Gates process and may push other projects further down the priority list. In other situations, we may be able to accommodate a new project or expanded project scope or cost by approving an appropriate distribution of funds from Emergent Demand.

Q. WHAT IS EMERGENT DEMAND?

A. Emergent Demand is a capital investment category created to ensure we are able to meet the unanticipated aging technology, cyber security threats, and efficiency needs that inevitably emerge in each year. Given the ever-changing nature of technology and emerging risks, it is not possible to identify all projects that may arise or become critical in a given year. For example, it is not always possible to predict what kind of security risk might be created by hackers as technology continues to develop. In other situations, as we develop a project with a particular scope, we may determine that additional benefits or long-term cost savings could be captured by expanding the scope of the project. Emergent Demand allows the Company to address such issues without necessarily delaying or cancelling previously-planned projects or otherwise absorbing unplanned work and costs.

Q. ARE THERE EVER INSTANCES WHERE THE COMPANY PLANS MORE PROJECTS THAN IT MAY BE ABLE TO COMPLETE IN A YEAR?

A. Yes. As I discuss in more detail later in my testimony, the demand for IT projects is significantly greater in any given year than the Company can fund. For 2022, the budget currently includes an adjustment to Emergent Demand to make our total Business Systems budget for the test year consistent with what we intend to place in service. This "credit" approach is beneficial to customers, as the Business System budget reflects the actual planned capital additions for Business Systems that the Company can currently fund, which the Company believes to be conservative compared to IT project demand. If the Company ultimately allocates more dollars based upon Company and customer needs, so that all projects can be completed, this will also benefit customers in that the Company would be funding projects above our cost recovery request in the 2022 test year.

3. Capital Cost Controls

Q. IN ADDITION TO THE TIG PROCESS, DOES BUSINESS SYSTEMS UNDERTAKE OTHER ONGOING STEPS TO CONTROL ITS COSTS?

A. Yes. Business Systems is continually taking steps to control costs. These efforts may include: increasing or decreasing the scope of outsourced services increasing or decreasing the use of consultants; and changing service providers. We also use competitive bidding practices and a multi-vendor sourcing strategy where possible, which enables the Company to utilize a combination of internal and external resources to minimize costs and maximize efficiencies in running our systems. In addition, Business Systems actively interacts with other IT organizations to learn how they control costs.

Q. CAN YOU PROVIDE MORE INFORMATION ABOUT THE COMPANY'S COMPETITIVE BIDDING PRACTICES?

A. Yes. Wherever possible, for the Company's key capital projects, the project team used, or will use, a competitive bid process to ensure that: (1) costs remain in-line with the approved budget; (2) Xcel Energy receives quality service at a fair price; and (3) business value is delivered per the agreed requirements. In addition, the project costs and schedules for these projects were based on internal experience with similar implementations and, in most cases, coupled with input from third-party consultants who we commissioned to ensure that the projects will deliver functionality that supports organizational objectives.

Generally, the only times a competitive bid process cannot be used are: (1) during upgrades to software or hardware components already provided by a vendor, in which engaging other providers would require a complete system overhaul; or (2) the limited times when multiple vendors are not available to undertake the necessary work or provide the necessary technology.

Q. CAN YOU IDENTIFY OTHER SPECIFIC COST CONTROL MEASURES THE COMPANY HAS UNDERTAKEN TO MANAGE COSTS?

A. Yes. When appropriate, we renegotiate contracts with key vendors and use a multi-vendor sourcing strategy to maintain competition between vendors for our business. One new example is our increased use of fixed bid versus time and materials agreements with vendors for project delivery activities. This improvement places a shared burden on the service providers to ensure costs remain within the expected totals.

Q. CAN YOU EXPLAIN IN MORE DETAIL WHY A MULTI-VENDOR SOURCING STRATEGY IS BENEFICIAL?

A. Yes. Business Systems relies on approximately 50 different vendors for the majority of the capital investments and O&M support, with our top ten vendors comprising approximately 89 percent of our total costs. By utilizing multiple vendors, we require these vendors to compete against each other for our business and create an incentive to keep the price of their services competitive. Overall, we are constantly managing spending, ensuring alliance with our budget, and looking for opportunities to control or reduce costs.

4. Cost Allocation to the Company and Overall Reasonableness

Q. HOW DO CAPITAL PROJECTS EXECUTED BY BUSINESS SYSTEMS AFFECT THE STATE OF MINNESOTA GAS JURISDICTION FROM A COST ALLOCATION OR ASSIGNMENT PERSPECTIVE?

A. Many of the Business Systems projects are planned and budgeted at the Xcel Energy Services or operating company level, and implemented throughout our system. Most projects benefit multiple jurisdictions – as when we implement new software throughout Xcel Energy – and therefore must be allocated or assigned to the appropriate operating companies.

In instances where a project is more fully dedicated to the Minnesota jurisdiction, a greater portion of the project costs may be assigned to Minnesota. In some cases where projects are dedicated wholly to Minnesota, those costs may be directly assigned to Minnesota. As I noted earlier in my Direct Testimony, capital additions in my testimony are stated at the NSPM (Total Company) level, including gas and common projects, but excluding any electric-only projects. Overall, Xcel Energy cost allocations are discussed by

Company witness Mr. Ross L. Baumgarten.

Q. IS THE OVERALL LEVEL OF BUSINESS SYSTEMS CAPITAL ADDITIONS REASONABLE?

A. Yes. Business Systems capital additions are necessary to maintain stability and reliability of the IT systems used by employees to serve Minnesota customers, efficiently manage business operations, protect Company data and information, and meet evolving regulatory and legal requirements. Overall, they support important investment strategies that focus on the key IT needs of the Company and our customers while balancing the need for overall cost containment and prioritization.

D. 2022 Capital Additions

Q. WHAT CAPITAL ADDITIONS IS BUSINESS SYSTEMS PROPOSING TO MAKE IN 2022?

A. The NSPM (Total Company) Business Systems 2022 capital additions included in our rate request are budgeted to be approximately $96.4 million as shown in Table 6 below. These investments are presented in the budget groupings aligning with the key investment needs described earlier in my testimony. This includes the Emergent Demand category that exists to support project changes in the other capital budget groupings. I will walk through the major projects for 2022 in each grouping in this section of my testimony, focusing on the capital additions.

Table 6

2022 Capital Additions

(Dollars in Millions)

2022 Categories	2022 Total
Aging Technology	$52.7
Cyber Security	16.1
Enhance Capabilities	22.4
Customer	7.9
Emergent Demand	(2.8)
NSPM Total	**$96.4**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

1. Aging Technology

Q. WHAT CAPITAL PROJECTS RELATED TO AGING TECHNOLOGY ARE INCLUDED IN THE 2022 TEST YEAR?

A. We anticipate a total of $52.7 million in capital additions in 2022 related to aging technology. In addition to more routine annual refresh projects, we will be placing specific projects in service that will have a significant impact on our IT across the Company. The individual projects are shown in Table 7 below. I first discuss our annual, routine refresh projects and then I walk through each of the specific refresh projects in the following testimony.

Table 7

2022 Aging Technology Capital Additions

(Dollars in Millions)

2022 Capital Additions	2022 Total
Annual Refresh	$14.4
Infrastructure Modernization	5.0
DR Technology Refresh	5.0
WAN NSPMN	4.0
Technology License	2.6
Oracle Exadata Refresh	2.6
Motorola Land Mobile Radio Core Upgrade	2.4
VoIP Refresh	2.0
DRMS (Demand Response Management System) Phase II	1.9
CASB beyond MCAS	1.5
2022 Oracle License	1.5
Rugged Tablets Refresh	1.3
SAP Purge Archive	1.2
Mainframe Modernization	1.2
Facility IT Investments	1.0
Aging Technology (small investments)	5.1
NSPM Total	**$52.7**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

a. Annual Refresh Projects

Q. PLEASE DESCRIBE "ANNUAL REFRESH" PROJECTS.

A. As I noted earlier in my Direct Testimony, routine refresh projects, or life-cycle management projects, refer to those projects that relate to updating or refreshing day-to-day technology on a routine basis. Budgets to upgrade technology components on an aggregate level are based on the lifecycles outlined by various original equipment manufacturers. Equipment lifecycles

can differ based on each category, but generally speaking most of our network, server and end user computing equipment are on an approximately five-year refresh lifecycle. Budgets are therefore based on refreshing approximately twenty percent of most equipment each year. The funding allocated within each specific group/year represents the aggregate of calculations to address two needs: (a) equipment replacement as outlined above; and (b) net new incremental, or "business-as-usual," growth. Routine refresh projects include the annual data storage refresh, the annual network refresh, the annual PC refresh, the annual printer refresh, and the annual server refresh. A summary of the refreshes we plan to undertake is set forth in Table 8 below.

Table 8

2022 Annual Refresh Capital Additions

(Dollars in Millions)

2022 Capital Additions	2022 Total
Annual Network Refresh	$4.9
Annual PC Refresh	2.6
Annual Server Refresh	2.9
Annual Storage Refresh	3.5
Annual Printer Refresh	0.6
NSPM Total	**$14.4**

Q. CAN YOU DESCRIBE THE DIFFERENT TYPES OF TECHNOLOGY THAT ARE COVERED BY EACH OF THESE REFRESH WORK ORDERS IN TABLE 8 ABOVE?

A. Yes. These refreshes cover:

- *Annual Network Refresh:* Planned replacement of network devices (switches, routers, radios, channel banks and voice systems) due to aging technology, out-of-support equipment, security vulnerabilities, and to enable new required capabilities. Lifecycle management for Operational

Technology (OT) Modernization will help to replace and/or decommission active end of life equipment. The scope of this work will include projects like Land Mobile Radio (LMR) replacements. End of life devices leave our network and infrastructure vulnerable; updates not installed can increase security risk.

- *Annual PC Refresh:* Replaces aging desktop and laptop computers, as well as those that are lost or inoperable. This project also provides devices to new employees.
- *Annual Printer Refresh:* Planned replacement of aging printers that will also fund printer improvements to allow widespread printer access and MDT replacements.
- *Annual Server Refresh:* Replaces aging servers prior to failure to support business growth and maintain reliability. Lifecycle management for infrastructure services will help to replace and/or decommission active end of life equipment including the replacement of servers and NetApp licenses.
- *Annual Data Storage Refresh:* Replaces data storage hardware that is no longer cost-effective to support, or that presents significant risk to operations due to aging components or lack of vendor support.

Q. CAN YOU PROVIDE AN EXAMPLE OF HOW A REFRESH PROJECT WORKS?

A. Yes. An example of this type of life-cycle management work is our Annual Planned PC Refresh project, in which we conduct a planned refresh of employee personal computers that are a year or more out of warranty. We use a "rolling PC Lifecycle refresh" approach, which replaces approximately 25 percent of the desktop computers annually based on the four-year average lifespan of a desktop computer. This lifecycle program was established in 2007

to ensure that the personal computers maintain their functionality and are compatible with existing software and other systems.

Within our Annual PC Refresh list, we also know that Annual Unplanned PC Refreshes will be needed. Unplanned refreshes cover PCs that must be replaced outside the pre-determined rolling life-cycle refresh. These are devices that may fail prematurely. It also covers new business demand, such as increases in computer user headcount. The project budget is based on historical trends and forecast demand growth.

Q. CAN YOU PROVIDE MORE INFORMATION ABOUT NETWORK REFRESH WORK BEING IMPLEMENTED DURING THE TEST YEAR?

A. Yes I can. For 2022, the Company will also conduct network refresh work that includes necessary replacement of Local Area Network (LAN) and Wide Area Network (WAN) telecommunications components across the Company. WAN replacements only include hardware components for this routine work, and other components are included in the WAN NSPMN project discussed below. Without replacement of these telecommunications components, there would be increasing instability, loss of reliability, and increasing safety and compliance risks related to these network components.

Q. HOW DOES BUSINESS SYSTEMS DEVELOP ITS BUDGETS FOR REFRESH PROJECTS?

A. While the budget methodology varies depending on the nature of the assets to be refreshed, generally, a refresh budget is determined by one or more of the following factors:

- The number of devices or systems that will reach end of life during the budget period. This is typically based on an established lifecycle plan.

For example, PCs, mobile data terminals, and portable meter reading devices have a four-year life. Thus, approximately 25 percent of them are replaced in an average year.

- The number of devices expected to permanently fail outside warranty, and in the case of portable devices, the number expected to be damaged, lost, or broken. This is based on historical trends.
- Planned incremental growth in demand (e.g., data storage, network bandwidth, number of computer users, new physical sites, etc.). This is based on Company and industry trends and known business plans.
- The devices or systems that must be replaced to meet new security, software compatibility, or business requirements.
- The devices or systems for which vendor support will cease or become prohibitively expensive.

Overall, these refresh efforts result in an orderly, thoughtful, and cost-effective means of managing aging technology while harvesting value from investments to the extent possible.

b. Infrastructure Modernization

Q. PLEASE DESCRIBE THIS PROJECT.

A. This project is made up of two major components that are intended to support our overall technology infrastructure:

- *Server OS Refresh*: There are Windows servers still using 2012 (or older) Operating Systems (OS) that need to be updated to a new version of Microsoft Server. This project involves managing the application teams to review their needs for the application residing on older Windows Server OS; if assessment reveals the need to migrate to a more current

version, a migration strategy is created and executed to more current Windows Server OS. In some cases, it may be necessary to move to new infrastructure and away from physical servers to virtual machines (VM). VMs provide the functionality of physical assets through the use of specialized hardware and software.

- *Tanzu*: This part of the effort will institute Tanzu, a container-hosting platform that helps our servers communicate with each other and enable Xcel Energy to modernize both its applications and the infrastructure it runs on. Similar to the way VMware prefers to have vRealize to be synonymous with cloud management and automation, the goal is to have Tanzu be synonymous with modern applications in the enterprise.

c. Disaster Recovery (DR) Technology Refresh

Q. PLEASE DESCRIBE THIS PROJECT.

A. This project will enable the Company to proactively test and implement a new methodology for system recovery during a disaster such as power outages and other system failures that can result in lost data and system issues. The project will help ensure business continuity, regardless of the circumstances. The DR Technology Refresh will replace aging disaster recovery hardware and will provide hardware and software solutions to ensure that the Company will be fully prepared to operate during a situation that could negatively impact the operation of the Company's primary systems.

d. Network Infrastructure Investments (WAN NSPMN)

Q. PLEASE DESCRIBE THIS PROJECT.

A. This project includes the detail design, planning, installation and commissioning of equipment that comprises an expansion and privatization of the Company's corporate WAN across our service territories. The WAN work includes network infrastructure investments to support connection between the Company's various locations together and providing the pathway to enable critical business services. Investments support communication services for our business including the SCADA connectivity for monitoring and control of the gas system. In addition, enterprise services are delivered to enable end users to connect to corporate applications like email, SAP (the GL and WAM systems), and internet access.

e. Technology License Project

Q. PLEASE DESCRIBE THIS PROJECT.

A. This project provides software license support across enterprise infrastructure and operations for the 2022 test year. To ensure adequate coverage, the Company will purchase additional licenses to support new and increasing numbers of licenses for common systems, such as Microsoft and Oracle, with users usually not tied to specific projects. Updating software licenses ensures that system devices are not over purchased and are running up-to-date licensed software, which decreases support costs and increases the Company's cyber security profile.

f. Oracle Exadata Refresh

Q. PLEASE DESCRIBE THIS PROJECT.

A. This project will deploy a new Oracle Exadata database platform that will replace the existing platform, which will reach the end of its life in 2021. Oracle Exadata is a software and hardware computing platform that runs Oracle Database for over 100 applications to store and organize data, which provides IT infrastructure for enterprise grid computing that manages information and applications for the Company in a flexible and cost-effective way. In addition, the Oracle Database will be upgraded to a new version in order to maintain vendor support and security patching. The Oracle Exadata platform also supports many other databases, including critical application databases.

g. Motorola Land Mobile Radio (LMR) Core Upgrade

Q. PLEASE DESCRIBE THIS PROJECT.

A. When there is no cell phone coverage, the only means of communications for workers out in the field is the LMR system, which is critical to the safety and productivity of Xcel Energy's field personnel. This project will complete all software and hardware updates to the current LMR system to remain in support, which allows for patching, improved support from Motorola, and proper adherence to security standards.

h. VoIP Refresh

Q. PLEASE DESCRIBE THIS PROJECT.

A. This project will upgrade Company technologies for the delivery of voice communications over the Internet. This refresh project represents both replacing legacy communications systems and upgrading to more modern VoIP (Voice over Internet Protocol) communication systems.

i. DRMS Phase II (Demand Response Management System) Phase II

Q. PLEASE DESCRIBE THIS PROJECT.

A. The DRMS Phase II project will replace the old/retiring systems by implementing platform components required to manage demand response dispatches for all programs, customer segments, and endpoints. The platform will manage events, control related endpoints, monitor participation, and retrieve related meter data. The platform will also provide integrations to Xcel Energy customer and program management systems, meter data systems, and billing systems. .

j. CASB beyond MCAS

Q. PLEASE DESCRIBE THIS PROJECT.

A. This project will implement a cloud access security broker (CASB), specifically the Microsoft Cloud App Security (MCAS). This will identify and help combat cyber threats. It improves visibility and mapping functions into our cloud applications, allowing the teams to see things like data travel, ensuring security and compliance across the entire base of SaaS (software as a service) apps.

k. 2022 Oracle License

Q. PLEASE DESCRIBE THIS PROJECT.

A. For 2022, this licensing work relates to the Company's upgrade of the Oracle database across the Xcel Energy enterprise as the current version of the Oracle database was at end of life and no longer supported by Oracle. Xcel Energy renegotiated its Oracle Perpetual Unlimited License Agreement (PULA) in 2021, which will lock in licensing pricing for five years and will ensure licensing requirements compliance with Oracle. The Oracle database supports many Xcel Energy critical systems.

l. Rugged Tablets Refresh

Q. PLEASE DESCRIBE THIS PROJECT.

A. "Rugged" tablets, or Mobile Device Terminals (MDTs), are generally used by Xcel Energy critical employees in the field in the areas of Distribution, Construction, Transportation, Emergency, Trouble, in both the electric and gas jurisdictions. Field supervisors and other skilled staff use MDTs to receive and complete work orders in the field in real-time. Devices that need to be replaced have not been refreshed in four to six years.

m. SAP Purge Archive

Q. PLEASE DESCRIBE THIS PROJECT.

A. This project will deploy a solution to appropriately archive Company data that is ever-growing and which has begun to impact system performance in some cases. The solution will archive data through tiered storage levels in order to better balance archival data needs while lowering costs and ensuring system performance and complying with legal data retention requirements.

n. Mainframe Modernization

Q. PLEASE DESCRIBE THIS PROJECT.

A. There are core applications running on a mainframe that was placed in service over eight years ago and is now out of support. This project is to replace the existing mainframe and Disaster Recovery with a solution that meets the needs of Xcel Energy.

o. Facility IT Investments

Q. PLEASE DESCRIBE THIS PROJECT.

A. New service centers or offices are built as needed to support growing or expanding communities. Facility IT investments represent the IT network infrastructure needed to connect these sites. This includes the construction of main distribution frames, intermediate distribution frames, cabling to connect workstations and phones, deployment of wireless access points, and the installation of any routers, switches and/or firewalls to secure the site.

2. Cyber Security

Q. WHAT CAPITAL PROJECTS RELATED TO EVOLVING CYBER SECURITY THREATS AND REQUIREMENTS ARE INCLUDED IN THE 2022 TEST YEAR?

A. We anticipate a total of $16.1 million in capital additions in 2022 related to cyber security as shown in Table 9 below. I discuss the projects that comprise the majority of the 2022 cyber security capital additions in the following testimony.

Table 9

2022 Cyber Security Capital Additions

(Dollars in Millions)

2022 Capital Additions	2022
SIEM+SOAR	$3.4
Firewall Rule Management	2.7
OT Shared Services	1.5
Vulnerability Scanning Refresh	1.1
Service Delivery Security Remediation	1.0
Cyber Security (small investment)	6.4
NSPM Total	**$16.1**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

Q. WHAT IS THE SIEM+SOAR PROJECT?

A. This project will implement and operationalize a combined suite of software products for Security Information and Event Monitoring (SIEM), User Behavior Analytics (UBA), and Security Orchestration, Automation, and Response (SOAR) for the Enterprise Command Center (ECC) that, once implemented, will increase and establish their cyber security capabilities. This project will mature and expand security capabilities and will provide benefits by more effectively and seamlessly protecting the Company from threats to its systems and allow it to better correlate and analyze a growing volume of data within the environment in a fast, accurate, and efficient manner by having the various capabilities of these programs in a common stack.

Q. PLEASE DESCRIBE THE FIREWALL RULE MANAGEMENT PROJECT.

A. This project will implement a new centrally-managed tool to maintain the Company's multi-vendor firewall hygiene program by providing end-to-end security views of firewall policies, rules, and configurations that impact the Company's security posture in an automated fashion.

Q. WHAT IS THE OT SHARED SERVICES PROJECT?

A. The OT (Operational Technology) Shared Services project consists of investments in the operational technology environment that are needed to support operations applications, such as gas SCADA. This project will reduce operational technology and regulatory business risks for enterprise strategic initiatives while providing value by supporting this environment with shared services.

Q. WHAT IS THE VULNERABILITY SCANNING REFRESH PROJECT?

A. The project will refresh the Company's vulnerability scanning capabilities in accordance with Xcel Energy's Security Standards. This specific refresh project will improve the Company's security posture and reduce the risk of data loss or breach of the Company's systems and is designed to increase the Company's security audit scores by increasing its security posture.

Q. WHAT IS THE SERVICE DELIVERY SECURITY REMEDIATION PROJECT?

A. This project work is necessary to ensure that the Company is compliant with Enterprise Information Security and Technology Standards. This work will consist of security remediation projects that will ensure compliance.

Q. PLEASE DESCRIBE OTHER CYBER SECURITY PROJECTS THAT THE COMPANY IS PLACING IN SERVICE IN 2022.

A. These projects include investments that provide prevention, detection, containment, and corrective services to protect the Company from security incidents, and assist in the recovery from any adverse events. It is imperative to refresh our technology to ensure continued compliance with regulatory requirements for customer data and overall corporate security objectives, while reducing our business's and our customers' exposure to evolving cyber security risks and vulnerabilities.

Examples of smaller 2022 projects include the Verint Security Camera Server Replacement, Data Loss Prevention work, Mandiant Security Validation, Enterprise File Encryption, PingFed MDHA, Advanced Endpoint Protection and Response, and other smaller cyber security projects. Cyber security investments support the availability, integrity, and confidentiality of our

information systems, and help ensure that we meet our legal and regulatory obligations and risk management objectives. Continually evolving cyber security threats and associated regulatory structure require ongoing investment into annual security technology refreshes.

3. Enhancing Capabilities

Q. WHAT CAPITAL PROJECTS RELATED TO ENHANCING COMPANY CAPABILITIES ARE INCLUDED IN THE 2022 TEST YEAR?

A. We anticipate a total of $22.4 million in capital additions in 2022 related to enhancing capabilities, as shown in Table 10 below. I discuss the projects that comprise the majority of the 2022 enhancing capabilities capital additions in the following testimony.

Table 10

2022 Enhancing Capabilities Capital Additions

(Dollars in Millions)

2022 Capital Additions	2022 Total
EXT Mobile Application Development	$8.5
SAP Continuous Improvements Placeholder	2.3
Enterprise Metadata Management	1.1
Employee Digital Experience Intranet Platform	1.1
Enhancing Capabilities (small projects)	9.4
NSPM Total	**$22.4**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

Q. WHAT IS THE EXT (EMPLOYEE EXPERIENCE TRANSFORMATION) MOBILE APPLICATION PROJECT?

A. The EXT program is building mobile applications for employees. The initial focus is on improving the employee experience for our field workers with apps such as Field Time Entry, Electric Outage Restoration, and Gas Emergency Response. This project is a new platform that will provide "backend" support for all mobile applications within the EXT portfolio. This project will enhance the Company's mobile applications capabilities, providing components such as authentication and authorization services, notification services, logging and monitoring services, integrations, and processes for developer operations. By equipping employees with more modern, convenient mobile apps, it allows them to be more effective in their jobs and improve delivery of services for customers.

Q. WHAT IS THE SAP CONTINUOUS IMPROVEMENTS PROJECT?

A. SAP is an enterprise application and continuous improvement and investment is needed to fully utilize the benefits of having an enterprise application. This is a multi-year project, with various components placed in service as assets are deployed. Examples of some of the components for this project include the Oracle Database upgrade, which is the primary database for SAP, and SAP scheduler was upgraded to improve scheduling to monitor and improve inefficiencies to optimize resources.

Q. WHAT IS THE ENTERPRISE METADATA MANAGEMENT PROJECT?

A. This project will deploy new software to enable metadata management across Xcel Energy and will enable numerous capabilities for metadata management and standardization. It will enable the management and publishing of consistent metadata definitions across the Company. It will also leverage the correct metadata and integrate the Company's systems in order to make effective data-driven decisions. This project will also facilitate standardizing metadata for business master data and standardize and consolidate among various sources from programs such as Microsoft Word and Excel.

Q. WHAT IS THE EMPLOYEE DIGITAL EXPERIENCE INTRANET PROJECT?

A. Large companies like Xcel Energy generally have intranet websites designed to facilitate employee communications, provide necessary information to employees, and to help facilitate how we serve our customers. This project will replace the current intranet site with a modern, more enhanced version that will enable Company employees to more productively and more efficiently communicate with other employees in a work environment that is ever more mobile and "deskless." This project will also act to lower costs and streamline Company intranet by having one, modern intranet site for all business areas.

Q. WHAT ARE OTHER PROJECTS TO ENHANCE CAPABILITIES THAT ARE BEING PLACED IN SERVICE IN 2022?

A. The Company is also placing in service many other smaller projects in 2022 that will enhance the Company's capabilities. These smaller projects, like large projects, also enable the Company to improve productivity, enhance communications between systems, and between people, and use data more efficiently. Examples of these projects are the MDO (Master Data Online)

Supply Chain Implementation, ServiceNow Enhancements, Kafka Expansion, and the Alteryx Server project.

4. Customer Experience

Q. WHAT CAPITAL PROJECTS RELATED TO ENHANCING THE CUSTOMER EXPERIENCE ARE INCLUDED IN THE 2022 TEST YEAR?

A. We anticipate a total of $7.9 million in capital additions in 2022 related to customer experience. The individual projects are shown in Table 11 below. I describe the majority of work that encompasses customer experience projects in the following section of my testimony.

Table 11

2022 Customer Experience Capital Additions

(Dollars in Millions)

2022 Capital Additions	2022 Total
CXT Budget	$4.2
CRS Application upgrade	1.7
Customer Service Console - Single Screen	1.2
Customer Experience (small investments)	.7
NSPM Total	**$7.9**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

Q. WHAT IS THE CXT BUDGET PROJECT?

A. The Company's work to improve the customer experience has been divided into four project areas: (1) Digital Channel Platforms (including MyAccount, the Company's website, Xcel Energy mobile applications, and new customers and real estate developers' initial connections with the Company (Customer Connect); (2) the Customer Relationship Management (CRM) Platform

(currently Salesforce); (3) Platform Infrastructure and Technology Maintenance; and (4) Data Analytics and Automation. These capital additions for 2022 within the CXT budget will continue CXT implementations by adding experiences and capabilities to the core CXT program. In successive years, we will add components to the foundational investments in order to build out the overall customer program to better serve and meet our customers' service expectations.

Specifically, for 2022, the Company continues building out the CRM platform and introduces new next-generation modules to the CXT platform to better serve our customers. The redesigned platform will enable us to track the different relationships with our customers, whether that is commercial, residential, industrial or on a different basis, with a goal of reducing O&M spend across high-cost channels and improve customer satisfaction. With a project of the size and scope of CRM, we also need to budget for post-implementation enhancements that play a critical role in supporting the overall CXT program. The CRM project built out the existing Salesforce CRM tool and introduced new modules to better understand and serve customers. Overall, these capital additions reflect continuation of the customer experience projects from previous years.

Additionally, we will continue to add customer experiences to the CXT platform, including enhancing our outages and notifications functions. In addition, we will have self-service capabilities, such as enrolling in services online and status of technicians. The outage work created a new, multi-channel outage experience for our customers that displays more accurate and timely outage information, and includes supporting more accurate restoration information.

Notifications work provides new capabilities within the Customer Relationship Management (CRM) platform that allow the Company to provide more accurate and proactive customer event notifications for billing and payments, outages, and other customer journeys. The new notifications approach will create more opportunities for communicating with customers, such as enabling two-directional text, and opening up a new channel for customers to pay their bills and to work with an agent in the future. Notifications work for 2022 will continue moving to a scalable solution that affords more experiences for our customers.

In 2022, we also implement new experiences for our New Customer Connect (NCC) platform (now called Builders and Remodelers Portal). This portal provides a better experience for builders, developers, and other larger Commercial & Industrial customers who engage with Xcel Energy to request new, resumed, or stopped service. The Company has already revamped the customer interface by providing better information to customers about the phase or status of their line extension process, improved the builders' call line, and improved the process for communicating with parties engaged in that process.

Finally, we are adding capabilities to our MyAccount platform. The MyAccount re-platform has already provided more enhancements for our customers, such as allowing for customers to set up their preferences, pay their bills or set up automatic payment options, and to receive information on their energy usage. For 2022, we implement new experiences for our customers, such as improved billing features in MyAccount that will be more user friendly and intuitive.

Q. WHAT IS THE CRS APPLICATION UPGRADE PROJECT?

A. The CRS is the Company's customer information system, which generates billing statements to retail customers on a monthly basis. This project is the initial strategy and first of a few projects that will remediate the larger CRS application that is supported by various software components, including those implemented under the CRS Tech Stack work, which is included among the small customer experience projects for 2022. The replacement will enable the Company to continue to maintain the stability, reliability, security, resilience, and efficiency of the CRS application.

Q. WHAT IS THE CUSTOMER SERVICE CONSOLE - SINGLE SCREEN PROJECT?

A. This project represents a component of the core CXT platform that has not yet been implemented. Currently, Company call center agents utilize numerous screens when communicating with customers on the phone. Combining numerous screens into one screen that contains all the information needed for customer service agents will simplify the experience for employees and benefit customers who will receive the information they need more quickly and efficiently. The "Single Screen" work, or also referred to as Agent 360, will also be integrated with Artificial Intelligence capabilities to help decipher what the inbound call is most likely about, and help identify the most immediate fix to the issue. In addition, the single screen will show the agent the current bill, history of payments, and payment plan options that are tailored specifically to the caller. Finally, this screen will suggest support offerings for the customer's home that can help save money or simplify the customer's energy experience. Together, our CXT investments support the Company's overall goal to enhance the customer experience.

5. Emergent Demand

Q. DOES BUSINESS SYSTEMS HAVE CAPITAL COSTS THAT SPREAD ACROSS ALL KEY BUDGET CATEGORIES?

A. Yes. Given the ever-changing nature of technology and emerging cyber security risks, it is not possible to identify all projects that may be needed in a given year. To ensure that we are able to meet our overall objectives, a number of years ago we created Emergent Demand as an efficient way to fund important and unexpected projects.

Q. HOW DOES EMERGENT DEMAND HELP ENSURE THAT BUSINESS SYSTEMS MEETS ITS KEY OBJECTIVES?

A. Emergent Demand provides Business Systems with the ability to assess and address, as appropriate, emerging technology needs as they arise.

For instance, we may identify a risk associated with existing technology that needs to be addressed earlier than initially planned. In other instances, we might begin implementing new software and then learn of a new function that is cost-effective to adopt at the same time the project is implemented.

Whether the funding requirement is from a scope change to an existing project, or to address a new risk or a new identified need, Emergent Demand allows us to effectively ensure adequate funding for projects that cannot always be predicted in our fast-changing environment.

Q. HOW LONG HAS BUSINESS SYSTEMS MANAGED EMERGENT NEEDS OF THE ORGANIZATION IN THIS WAY?

A. We began specifically planning for emergent needs in this manner in 2013. Prior to creation of the Emergent Demand budget we had to delay or cancel previously-planned projects or absorb unplanned work and costs when a new technology or critical need was identified. These changes would often disrupt the parts of the business relying on our original plan, and would impact other long-term plans that affect the Company, our customers, or both.

Q. WHAT PROCESS WAS USED TO ESTABLISH THE TEST YEAR EMERGENT DEMAND BUDGET?

A. Beginning with the timeframe of our 2016 Minnesota electric rate case, to develop the Emergent Demand budget, we reviewed our experience with emergent demand and tailored the budget for future years to forecasted spending levels and in alignment with overall Company budgeting. Over the last few years, the 2018-2020 Emergent Demand funds were completely distributed to other projects.

Q. WHY IS THE BUDGET FOR EMERGENT DEMAND IN 2022 A RELATIVELY SMALL, NEGATIVE NUMBER?

A. Our total Business Systems budget for Emergent Demand in 2022 is ($2.8) million. This credit amount reflects that we have more projects than room in our total Business Systems budget for 2022, and that we will need to delay or decide against undertaking a project or projects, or else allocate more funds from another area to meet our budget for the year. We included a credit in Emergent Demand to reflect that the specific project to be cut was not yet determined as of the date this testimony was prepared.

This credit exists because the demand and need for IT solutions to address aging technology, address cyber security, and enhance our capabilities across the enterprise is so high, and increasing. Over the remainder of the year, either additional dollars will be allocated to Business Systems to allow all projects to go forward, or certain projects may be delayed to a future year such that the need for a net credit in Emergent Demand will reduce to zero. Either way, this credit demonstrates our focus on cost containment overall, and that Business Systems will be implementing, at a minimum, its overall capital budget.

Q. WHAT ARE THE BENEFITS OF BUDGETING FOR EMERGENT DEMAND?

A. In addition to being available to undertake emerging projects as I describe above, Emergent Demand allows us to more comprehensively vet requested changes in individual project scope. Before a project team can access Emergent Demand funds, a project must again be reviewed and approved under the TIG process.

Q. CAN YOU EXPLAIN IN MORE DETAIL HOW REQUESTS FOR FUNDING FROM EMERGENT DEMAND ARE REVIEWED?

A. Yes. Requests for funds from Emergent Demand, including any request that may arise for a new project or for more funding on an existing project, are reviewed to ensure need. Emergent Demand therefore provides another layer of governance for existing projects, because they must receive an additional round of approval before being allocated funds from Emergent Demand.

Q. IS THE BUSINESS SYSTEMS BUDGET HIGHER THAN PREVIOUS YEARS BECAUSE OF EMERGENT DEMAND?

A. No. The 2022 budget level was initially established by reviewing the capital plan

and then creating an Emergent Demand funding level for the budget based on business priorities, balanced by the overall business area capital spending guidelines. We continue to refine the Emergent Demand budget with each new budgeting cycle, removing dollars from this capital budget grouping and assigning them to projects that have become more definite in scope and planning. In sum, we are ensuring our budgets are managed carefully and are reasonable in the face of significant increasing demand.

Q. WHAT DO YOU CONCLUDE WITH RESPECT TO THE OVERALL LEVEL OF BUSINESS SYSTEMS CAPITAL COSTS THE COMPANY IS SEEKING TO RECOVER IN THIS RATE CASE?

A. The overall level of Business Systems costs is reasonable, as shown by the above discussion, and is necessary to support an appropriate level of service to our customers. Finally, the costs included in our 2022 capital budget are representative of the types of work we must do year over year.

IV. O&M BUDGET

A. O&M Overview

Q. WHAT IS INCLUDED IN THE BUSINESS SYSTEMS O&M BUDGET?

A. The Business Systems O&M budget consists of costs related to the operation and maintenance of existing IT assets such as software systems, computers, printers, phones, radio systems, and servers. It also includes annual software contract and license fees, as well as maintenance agreements, for existing software and hardware. In addition, the O&M budget includes non-capitalized costs associated with developing, enhancing, and maintaining new or existing IT systems.

Q. WHAT ARE THE OVERALL TRENDS FOR BUSINESS SYSTEMS' O&M EXPENSES?

A. Beginning in 2012, as we entered a new phase of capital investment, our costs began to increase – largely because new IT capital investments typically require additional licensing fees, other operational costs, and more complex maintenance. From 2018 through 2020, Business Systems O&M costs increased largely due to our need to maintain new GL and WAM assets while also maintaining prior IT capital investments. Looking ahead to 2022, we anticipate continued cost increases reflecting the addition of new capital investments.

Q. HOW DO YOU RECONCILE THESE HIGHER BUDGETS WITH THE NEED TO ENSURE CUSTOMER VALUE FOR COMPANY INVESTMENTS?

A. These investments benefit our customers in several respects. First, our customers have benefited from lower O&M and capital costs in previous years where we deferred and avoided technology investments by harvesting maximum value from our current systems. However, as previously discussed, we cannot defer investments to replace dated technology or old hardware indefinitely and need to make investments to continue to serve our customers and to protect them and our business from cyber security and system failure risk. Second, our investments in technology help other business areas serve customers efficiently and effectively. Finally, our investments are intended to maintain and enhance our service to customers, including in the ways customers interact with Xcel Energy. Without making these investments, we could not provide reliable, quality service to our customers.

Q. WHAT IS THE COMPANY'S BUSINESS SYSTEM'S O&M BUDGET FOR THE 2022 TEST YEAR?

A. The total Business Systems O&M budget for the 2022 test year is $10.9 million. The basis for this budget is set forth in detail below. I present the Business Systems O&M budget on an NSPM Gas basis.

Q. WHAT ARE THE BASIC CATEGORIES OF THE O&M BUDGET?

A. The test-year Business Systems O&M budget for natural gas service can be broken down into 8 categories: (1) Network Services; (2) Software License and Maintenance; (3) Company Labor; (4) Application Development and Maintenance; (5) Contract Labor and Consulting; (6) Shared Assets Allocation; (7) Hardware Purchases and Maintenance (including equipment maintenance); and (8) Other. Table 12 below shows the 2022 Business Systems O&M budget by category, in addition to actuals for 2018-2020 and partially in 2021:

Table 12

Business Systems 2018-2022 O&M Actual and Budgeted Expenditures

(Dollars in Millions) (NSPM Gas)

Cost Category	2018 Actuals	2019 Actuals	2020 Actuals	2021 Actual/ Forecast	2022 Budget
Network Services	$1.3	$1.5	$1.1	$1.0	$1.0
Software License and Maintenance	2.5	2.5	2.6	2.8	3.8
Company Labor	1.1	1.4	1.4	1.3	1.6
Application Development and Maintenance	1.4	1.5	1.6	1.6	1.6
Contract Labor and Consulting	.8	.7	.6	.3	.4
Shared Asset Allocation	2.0	2.1	2.5	2.2	2.2
Hardware Purchases and Maintenance	.2	.2	.2	.3	.2
Other	.7	.4	.3	.1	.2
Total	**$9.9**	**$10.5**	**$10.2**	**$9.6**	**$10.9**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

Q. WHAT ARE THE MAJOR COST DRIVERS OF THE 2022 BUSINESS SYSTEMS O&M BUDGET?

A. Of the categories listed above, I consider two as primary drivers of our Business Systems budget during the test year: (1) Software License and Maintenance; and (2) Company Labor. I describe each of the other budget categories later in my testimony, and explain why network needs, licensing costs, labor costs, and the ongoing security needs to keep our software maintenance up to date is increasing in the Company's business-as-usual IT costs.

Q. HOW DOES THE 2022 BUDGET TREND FROM 2021 TO 2022?

A. The 2022 budget is approximately 14 percent higher than the 2021 actuals/forecast Exhibit___(MOR-1), Schedule 3 also provides a further breakdown of O&M costs.

Q. HOW HAS THE COVID-19 PANDEMIC AFFECTED THE BUSINESS SYSTEMS O&M LEVELS FOR 2020-2021 AND FORECAST FOR 2022?

A. While the coronavirus pandemic has at times changed how we conduct our business, as discussed earlier in my testimony, it has not materially changed Business Systems' O&M costs for 2020 and so far in 2021. Travel is down, but remains a small portion of our overall budget. Other work continues, and in some cases has increased as Business Systems works to serve employees working from home and in new ways due to the pandemic. Our 2021 and 2022 budgets reflect these limited changes.

B. O&M Budget Process

Q. HOW DOES THE COMPANY SET THE O&M BUDGET FOR THE BUSINESS SYSTEMS BUSINESS UNIT?

A. Our O&M budget process is similar to our capital budget process in that both are based on a partnership between corporate management of overall finances and the business needs we identify. Ms. Ostrom explains how the Company establishes business area O&M spending guidelines and budgets based on financing availability, specific needs of business areas, and overall needs of the Company. Overall, we establish a reasonable annual O&M level that allows Business Systems to complete priorities that are important to providing a reasonable level of services to the Company and our customers.

Q. DOES BUSINESS SYSTEMS EVER NEED TO CHANGE THE USE OF BUDGETED O&M FUNDS DURING THE FINANCIAL YEAR?

A. Yes. As mentioned earlier in my testimony, Business Systems adjusts for changing business impacts such as updates in technology, customer expectations, operating priorities of the business units across the Company, and the Company finance area. There are times when O&M funds are shifted within Business Systems during the year, typically to address unplanned requirements.

Q. HOW DOES THE COMPANY DETERMINE CHANGES IN THE BUSINESS SYSTEMS O&M BUDGET FOR FUTURE YEARS?

A. As part of the Company's annual budget process, Business Systems performs a review of existing services and expected new services to determine budget needs for future years. This includes an evaluation of annual contract cost escalators for vendors, annual merit increases, changes in the quantity of services estimated to be consumed, and new services. This information is reviewed and evaluated through the budget process and a budget is established for Business Systems for future years.

Q DOES THE COMPANY HAVE A PROCESS FOR MITIGATING DEVIATIONS IN ACTUAL EXPENDITURES COMPARED TO BUDGETED EXPENDITURES?

A. Yes. As I previously described for the capital budget, Business Systems management monitors actual versus budget expenditures for both capital and O&M efforts on a monthly basis. Deviations are evaluated and action plans are developed to mitigate variations in actual to budgeted expenditures. These mitigation plans may either reduce or delay other expenditures to support the overall authorized budget. If authorized budget adjustments are required, they are identified and approved at an appropriate level of management.

C. O&M Budget Detail

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. In this section, I describe in detail the components of Business Systems that make up the O&M budget and discuss ways that the Company mitigates O&M cost growth for that particular component.

1. Network Services

Q. WHAT ARE NETWORK SERVICES?

A. This category includes costs related to the maintenance of existing circuits, phones, microwave and radio systems, and other IT network infrastructure assets. Network activities provide operation and management of the Company's internal and external data transmission requirements. Network services are budgeted based on a price times a quantity. These costs are dependent upon Xcel Energy's service usage levels and the number of assets in use. As more IT infrastructure is put in place, network maintenance costs increase.

Q. WHAT NETWORK ENHANCEMENTS COST CHANGES ARE YOU ANTICIPATING DURING THE TEST YEAR?

A. Network services in 2022 reflects the increased usage of the organization's network to support new applications and demand for greater speed and capacity to support existing systems. These usage and demand needs increase each year, as technology advances, new requirements or capabilities are identified and sites are added. Fortunately, the costs are relatively flat during the test year due to various actions taken by the Company, including the insourcing of work previously performed by IBM, terminating that contract, and changing the vendor that manages our network circuits. This has resulted in cost savings

realized in O&M that would otherwise be higher.

Network services also encompass the need to upgrade and replace aging components of the network. For example, the SCADA circuits that have been in place for many years for transmission and distribution purposes are based on analog technology. That technology is now digital and those new digital circuits require maintenance to keep current. Another example is the Company's investment in expanding the wireless network in its offices and service centers to aid productivity. This expansion places new assets in service that must be maintained.

In addition, our network projects identified in the capital section of my testimony allow for growth and the ability to better control future O&M network costs. We have operated much of our older network equipment without maintenance, opting for a time and material repair strategy as needed and thereby reducing costs.

Network services costs for the 2022 test year are $1.0 million.

2. Software License and Maintenance

Q. WHAT IS SOFTWARE LICENSE AND MAINTENANCE?

A. This category includes expenses for payments to vendors for license agreements associated with various applications and desktop tools used by the Company to perform services. These payments cover updates, support patches, fixes and technical support.

Q. WHAT SOFTWARE LICENSE AND MAINTENANCE COST CHANGES ARE YOU ANTICIPATING FOR THE 2022 TEST YEAR?

A. There are three major drivers of increase to the 2022 budget, stemming overall from increasing costs in the industry. First, software costs are driven by net new projects, such as our CXT program, and other investments. Second, there are increased licensing costs driven by users, escalators in contracts, and upgrades. Third, maintenance and support must be updated to limit vulnerabilities, with cyber security threats increasing all the time, it's more important than ever to keep software maintenance current and in support. Overall, software license and maintenance costs have increased from $2.8 million in 2021 to $3.8 million in 2022.

Q. PLEASE DISCUSS EFFORTS TO MINIMIZE INCREASES IN SOFTWARE MAINTENANCE COSTS.

A. There are several efforts used to reduce the growth in this category. First, we evaluate the need for maintenance support on applications that will be replaced. For example, as part of our upgrade of project management software consolididating a common solution across business areas, creating a common scheduling platform across Gas Operations and Distribution. Second, we evaluate the usage of desktop software to determine if the usage justifies the continued need for a product. For example, if a computer user has not used a software product recently, we redeploy the license to a user who has requested the software, thereby avoiding the need to purchase a new license for that user. Finally, we review contracts with vendors as part of the contract renewal process to reduce costs. For example, we might extend the term of a maintenance agreement in order to receive a larger discount, right-size a contract to align to actual usage, or cancel a contract altogether.

3. Company Labor

Q. WHAT COMPANY LABOR COSTS ARE INCLUDED IN THE BUSINESS SYSTEMS O&M BUDGET?

A. Our labor costs include the cost associated with all employees in the Business Systems department.

Q. WHAT COMPANY LABOR COST CHANGES DO YOU ANTICIPATE FOR THE 2022 TEST YEAR?

A. Labor costs for the test year are $1.6 million in 2022. From 2021 to 2022, labor is increasing by $0.3 million. The increases are due to two primary reasons. First, we are hiring in-house expertise to support new and existing applications that will be offset outside Contract and Consulting work. Second, salary and merit pay increases also contributed to the increase in 2022.

Q. PLEASE DISCUSS EFFORTS TO MINIMIZE INCREASES IN COMPANY LABOR COSTS.

A. Company labor costs are based on the employee headcount required to provide IT services to the organization. The employee headcount is managed through a workforce plan process that monitors changes and includes attrition information as well as emergent needs. Changes to employee headcount for replacement related to attrition or for new headcount require assessment of the need for the personnel, the associated risks with not filling the position, and alternative options. This process has worked effectively and assures we have the correct resources in place with the right skills and allows us to manage costs.

4. Application Development and Maintenance

Q. WHAT IS APPLICATION DEVELOPMENT AND MAINTENANCE (ADM)?

A. ADM includes costs of services to develop, enhance, maintain, and consult on new or existing IT software and hardware applications.

Q. WHAT ADM COST CHANGES DO YOU ANTICIPATE FOR THE 2022 TEST YEAR?

A. ADM costs have modestly increased over the past several years, due largely to a 2017 contract renegotiation that resulted in lower costs going forward, but offset by added software programs. In addition, we continue to thoroughly evaluate our application portfolio on a regular basis, to limit new development for those applications that will be replaced in the near future. Going forward, ADM costs are budgeted to be relatively flat at $1.6 million in 2022 compared to previous years.

5. Contract Labor and Consulting

Q. WHAT COSTS ARE INCLUDED IN THE BUDGET AS CONTRACT LABOR AND CONSULTING?

A. These costs consist of fees and expenses for professional consultants or knowledge-based experts that are not employees of the Company. This category also includes staff augmentation through staffing agencies.

Q. WHAT CONTRACT LABOR COST CHANGES DO YOU ANTICIPATE FOR THE 2022 TEST YEAR?

A. Contract labor costs are expected to decline to $0.4 million for the 2022 budget from 2018-2020 levels. Actuals from 2018-2020 are higher than the 2022 budget due primarily to continuing to bring steady state work to Company employees rather than outside vendors, which results in Company labor

increases described above, but also greater consistency and internal expertise.

6. Shared Asset Allocation

Q. WHAT IS SHARED ASSET ALLOCATION?

A. This category reflects the allocation of Business Systems costs to or from the NSPM operating company, depending on where the asset was purchased and how an investment will be utilized between Xcel Energy operating companies. The dollars associated with this category are, in a sense, a true-up of costs related to a certain investment by assigning to the appropriate jurisdiction(s). This number fluctuates in part on the basis of the jurisdiction in which an investment is purchased, consistent with our capital asset and cost allocation policies discussed by Ms. Wold and Mr. Baumgarten. For example, the dollars in this account will decrease when an asset is purchased in NSPM but is also utilized in other operating companies. For years 2022 the budget is $2.2 million, staying flat from 2021.

7. Hardware Purchases and Maintenance

Q. WHAT IS INCLUDED IN THE HARDWARE PURCHASES AND MAINTENANCE CATEGORY?

A. Our hardware maintenance costs relate largely to vendor contracts we maintain to support hardware systems. This cost category also includes miscellaneous hardware equipment purchases for materials such as batteries, memory cards, keyboards, headsets, and related technical tools. In 2019, due to the minimal amounts charged to equipment maintenance, that category was remapped to rollup in the hardware purchases and maintenance category.

Q. WHAT HARDWARE PURCHASES AND MAINTENANCE COST CHANGES DO YOU ANTICIPATE FOR THE 2022 TEST YEAR?

A. Costs for this category are expected to fluctuate based on the work being performed and is budgeted for $0.2 million in 2022. The overall costs in this category combined with remapping of equipment maintenance remain relatively flat.

8. Other

Q. WHAT COSTS REMAIN IN THE "OTHER" CATEGORY?

A. This category includes very small purchases for administrative materials, distributed systems services, employee expenses, Mainframe, dues, fleet chargeback expenses, and internal building moves.

Q. WHAT CHANGES IN "OTHER" DO YOU ANTICIPATE FOR THE 2022 TEST YEAR?

A. Costs in this category are $0.2 million in 2022.

Q. WHAT DO YOU CONCLUDE ABOUT BUSINESS SYSTEMS' O&M COSTS OVERALL?

A. We have worked hard in recent years to contain O&M costs, which is reflected in the number of O&M categories with flat expense levels and budgets between past and future years. Where costs are rising, this is due to increased investment in capital, and increased demand for technology services such as network and data support. In turn, these increases in demand are consistent with the overall direction and rising needs for IT services in all types of businesses. As such, our O&M cost levels reflect prudent management and cost containment.

V. CONCLUSION

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

A. I recommend that the Commission approve the Business Systems capital and O&M budget presented in this rate case. Our planned capital investments are managed appropriately and established to address aging technology, cyber security, customer experience, enhanced capabilities, and emerging demand for the Company. The budgets we propose are a reasonable representation of the activities we will undertake on behalf of the Company and ultimately our service to customers through 2022 and beyond.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

MICHAEL OWEN REMINGTON

414 Nicollet Mall, Minneapolis, MN 55401

PROFESSIONAL EXPERIENCE

Regulatory Director, Business Systems Advanced Grid (February 1 2021 to present)

- Responsible for regulatory filings and related activities in support of Xcel Energy's advanced grid initiative.
- Sworn witness for IT business unit in rate cases, riders, certificates of public convenience and necessity, and other filings across several jurisdictions.

Director, IT Operations, Xcel Energy, Minneapolis, MN (July 2019 to January 31 2021)

- Accountable for IT service management, critical incident management, disaster recovery, enterprise monitoring, and regulatory compliance.
- Led four managers and an organization of 30 employees.
- Team managed 9,000 IT change requests and 140,000 IT service requests per year; 55,000 device monitors in place, 70 support team referrals per day, and over 1,000 incidents per year resolved prior to an outage.
- Sworn witness for Texas and New Mexico rate cases.

Senior Business Manager, Xcel Energy, Minneapolis, MN (July 2008 to June 2019) (interim assignment below)

- Critical incident manager (on-call rotation): Responsible for representing business and customer interests during technology-related outages or situations of elevated risk.
- Led a team responsible for IT service processes (Problem, Change, Request, and Asset Management).
- Led implementation of a single-pane-of-glass service request portal and automated request fulfillment.
- Drafted effective testimony and discovery responses in support of nine public utility rate cases in three jurisdictions.

Attorney and Solutions Consultant, Xcel Energy, Minneapolis, MN (November 2013 to December 2014)

- A one-year assignment to the General Counsel and Legal Services organization, dotted line report to the Deputy General Counsel.
- Built a constructive relationship between IT and Legal Services. Provided IT leadership with a better understanding of the unique business requirements of in-house corporate counsel.
- Legal practice included transactional work and investigations of whistleblower & EEOC complaints.
- Led the successful implementation of an Early Case Assessment tool (Autonomy Investigator/ECA).

Systems Analyst, IBM Global Services, Minneapolis, MN (October 2000 to July 2008)

- Liaison between the business customers and the IT organization, focusing on the evaluation, selection, architectural design, and implementation of new business applications.
- Received top ratings from both customers and supervising managers.

EDUCATION

- Juris Doctor, *Magna Cum Laude*, Mitchell Hamline School of Law, St. Paul MN (May 2011)
- Certificate in Dispute Resolution, Hamline University School of Law
- Bachelor of Arts, Political Science, University of Minnesota, Minneapolis MN

PRESENTATIONS

- *Information Technology Transactions: Lessons Learned from Real World Cases*, Nov 4, 2019, Minnesota CLE Tech Law Institute (with Michael R. Cohen)
- *Critical Infrastructure Protection - Cyber Security and the Bulk Electric System*, Feb 12, 2019, Minnesota State Bar Association
- *Tailoring Enterprise Incident Management for CIP Compliance*, May 25, 2017, Mid-Continent Compliance Forum

OTHER QUALIFICATIONS, EXPERIENCE AND VOLUNTEERISM

- LEAN Practitioner
- ITIL v3 Foundations Certified
- Licensed Minnesota attorney
- Chair, Technology Committee, Minnesota State Bar Association (MSBA) (2015 to 2018)
- Council member, MSBA Tech Law Section (2018 to present)
- Council member, MSBA Public Utilities Section (2021 to present)
- Associate Editor, Hamline Law Review
- Board member, Friends of Saint Paul College Foundation
- Board president, Xcel Energy Employee Political Action Committee
- Volunteer Service Award, BestPrep (2020)

MN Gas Witness	Remington
Item Desc	CWIP Closings

Sum of Total Major category	Project ID	Unifier Name	Activity Year 2022
Aging Technology	**D.0002011.008**	WAN NSPMN	1,000
	D.0002011.013	WAN NSPMN	3,999,000
	D.0002021.001	Facility IT Investments	1,002,428
	D.0002062.001	Mainframe Modernization	1,166,720
	D.0002082.001	Video Conferencing Enablement	464,231
	D.0002086.001	2022 Remittance Software Refresh	475,834
	D.0002106.001	VoIP Refresh	2,020,617
	D.0002109.005	Rugged Tablets Refresh	1,286,000
	D.0002125.001	DR Technology Refresh	5,030,000
	D.0002149.001	DRMS Phase II (Demand Response Management System) Phase II	1,946,000
	D.0002153.001	Technology License	2,568,259
	D.0002161.001	OSI Soft PI Enterprise Agreement	583,840
	D.0002176.001	SAP Purge Archive	1,221,480
	D.0002260.001	2022 Oracle License	1,516,814
	D.0002262.001	Real Property Asset Management Upgrade or Replace	100,931
	D.0002339.001	Technology Business Management	407,485
	D.0002340.008	Oracle Exadata Refresh	2,551,964
	D.0002354.001	Annual Refresh	1,526,116
	D.0002355.001	Annual Refresh	600,000
	D.0002356.001	Annual Refresh	3,500,004
	D.0002373.001	Motorola LMR Core Upgrade	2,446,068
	D.0002376.001	Infrastructure Modernization	5,000,000
	D.0002378.003	O365 Email Legal Hold	643,981
	D.0002440.003	IEE 8.2 to 10.0 Conversion	841,838
	D.0002452.001	Loss Prevention Tracking	409,185
	D.0002482.005	Annual Refresh	2,326,444
	D.0002488.005	Annual Refresh	3,813,097
	D.0002489.005	Annual Refresh	2,609,781
	D.0002500.001	Fabric Refresh	650,000
	D.0002503.001	Orbus iServer	507,254
	D.0002504.001	CASB beyond MCAS	1,518,428
Aging Technology Total			**52,734,799**
Customer	**D.0002037.022**	Customer Service Console - Single Screen	1,201,829
	D.0002137.001	CRS Tech Stack Upgrade	169,117
	D.0002137.010	CRS Tech Stack Upgrade	12,217
	D.0002209.009	2020 Handheld Mobile Collector Refresh	509,234
	D.0002209.015	2020 Handheld Mobile Collector Refresh	9,000
	D.0002222.002	CRS Application upgrade	1,749,345
	D.0002246.001	AutoSys Refresh 2019	4,249,529
	D.0002253.007	Strategist Replacement	325
	D.0002300.009	Enterprise Purge Archive	3,328
Customer Total			**7,903,925**
Cyber Security	**D.0001807.001**	IT Blanket-Security	834,340
	D.0002269.009	OT Shared Services	1,500,000
	D.0002296.001	Service Delivery Security Remediation	1,023,960
	D.0002371.003	F5 Renewal	231,996
	D.0002384.003	Analog Security Camera Upgrade	500,000
	D.0002416.001	Verint Security Camera Server Replacement	960,380
	D.0002418.001	SIEM+SOAR	3,373,570
	D.0002478.001	Firewall Rule Management 2021	2,674,964
	D.0002497.001	Vulnerability Scanning Refresh	1,062,900
	D.0002498.001	Advanced Endpoint Protection & Response Refresh	506,143
	D.0002499.001	PingFed MDHA	642,801

Cyber Security	**D.0002501.001**	Data Loss Prevention	759,214
	D.0002505.001	Visitor Management	253,071
	D.0002506.001	Mandiant Security Validation	759,214
	D.0002507.001	PingFed v10 Upgrade	253,071
	D.0002509.001	Enterprise File Encryption	737,400
Cyber Security Total			**16,073,023**
Emergent Demand	**D.0002059.001**	IT Blanket - Foundational Capabilities	(1,197,674)
	D.0002061.001	IT Blanket - Core System Modernization	1,344,357
	D.0002428.001	IT Blanket - Digital Analytics and Innovation	(2,939,208)
Emergent Demand Total			**(2,792,525)**
Enhance Capabilities	**D.0002020.015**	SAP Continuous Improvements Placeholder	2,291,850
	D.0002044.001	Enterprise Metadata Management	1,120,051
	D.0002277.003	EXT Mobile Application Development	3,896,140
	D.0002283.009	Avaya Cloud Voice Deployment	255,200
	D.0002363.002	SPS Microwave - Southern Ring Closure	578,556
	D.0002374.001	User Modernization	475,000
	D.0002395.007	Digital Ops Factory	431,416
	D.0002399.019	NSPWI Microwave	69,182
	D.0002402.003	iSeries Software Functionality	358,657
	D.0002409.003	Integration Resiliency	75,619
	D.0002432.003	EXT Mobile Application Development	4,586,789
	D.0002438.003	Enterprise Data Analytics Data Science Tool	304,277
	D.0002443.003	Gas Frontline Enablement and Experience	598,445
	D.0002449.003	Alteryx Server	445,500
	D.0002449.007	Alteryx Server	250,000
	D.0002450.003	Multi-State Customer Refund Engine	357,349
	D.0002451.003	Worktool Consolidation	357,349
	D.0002454.001	FARR replacement	366,154
	D.0002456.001	Distribution and Gas Capital Planning	226,587
	D.0002457.001	Bananatag Internal Email Analytics	196,148
	D.0002459.001	SharePoint Architecture Alignment	167,533
	D.0002463.001	Account Reconciliation	10,077
	D.0002469.003	BI Environment Refresh	200,075
	D.0002473.001	Exemption Certificate Management	309,850
	D.0002491.003	MDO Supply Chain Implementation	944,460
	D.0002492.003	Employee Digital Experience Intranet Platform	1,097,777
	D.0002494.001	FERC Cost Traceability Process Improvement	809,668
	D.0002496.003	Kafka Expansion	737,400
	D.0002512.001	ServiceNow Enhancements	917,358
Enhance Capabilities Total			**22,434,467**
Grand Total			**96,353,688**

Business Systems 2018-2022 O&M Budget by Category ($'s millions)
NSPM Gas

Cost Category	2018 Actuals	2019 Actuals	2020 Actuals	2021 Actual/ Forecast	2022 Budget
Network Service	$1.3	$1.5	$1.1	$1.0	$1.0
Software License	2.5	2.5	2.6	2.8	3.8
Company Labor	1.1	1.4	1.4	1.3	1.6
Application Deve	1.4	1.5	1.6	1.6	1.6
Contract Labor a	0.8	0.7	0.6	0.3	0.4
Shared Asset Allo	2	2.1	2.5	2.2	2.2
Hardware Purcha	0.2	0.2	0.2	0.3	0.2
Other	0.7	0.4	0.3	0.1	0.2
Total	**$9.90**	**$10.50**	**$10.20**	**$9.60**	**$10.90**

*There may be differences between the sum of the individual category amounts and Total amounts due to rounding.

Xcel Energy®

Customer Experience Satisfaction

Performance Trends

September 2019

CX MEASUREMENT AT XCEL ENERGY

Channels

- Contact Center Phone Agent & IVR
- Website & My Account
- Mobile App
- Notifications
- Email Correspondence
- Customer Connection

Key Moments

- Start/Stop/Transfer service
- Billing & Paying
- Outage Reporting & Notifications
- Finding Solutions
- New Construction

Xcel Energy®

OVERVIEW OF CUSTOMER EXPERIENCE SURVEYS

Capturing feedback from over 370,000 customer responses since launching our new surveys starting in 2016 or later

Channel	Description	Customer Responses since Launch	Launch Date
Website	Online pop up survey offered to 100% of customers visiting XE.com and My Account	79,489	2016
Mobile App	Measures satisfaction and ease of use within the mobile app	3,293	2018
Contact Center Agent (Experience survey)	Phone survey to customers completing a transaction with an Xcel phone agent	34,626	2016
Contact Center Agent (Post Call survey)	Brief automated IVR survey to customers completing a transaction with an Xcel agent	164,523	2016
Contact Center IVR	Brief automated IVR survey to customers completing transaction through the IVR	36,338	2016
Email Correspondence	Online survey to customers corresponding via e-mail with an Xcel contact center agents	6,639	2018
Outage Notifications	Online survey that measures satisfaction, ERT accuracy & timeliness (text/email)	45,611	2017
Customer Connection	Measures satisfaction with all phases of installing and connecting new electric and/or natural gas service process	2,167	2017

Xcel Energy

Key Takeaways & Recommendations

As more customers move toward completing transactions in our **digital channels**; satisfaction has been worsening. Scores have significantly declined in 2019 in our Website and Mobile App, while our non-digital channels (Agent, E-mail) continue to significantly outperform.

Currently planned initiatives in 2019/20 to improve digital tools must proceed as scoped to pick up digital satisfaction

Billing and Payment and **Outage** satisfaction continue to trend significantly lower for the website channel compared to non-digital channels.

Maritz CX Xcel Energy

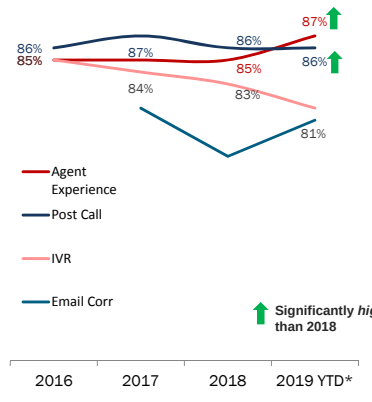
Overall Digital & Non Digital Trend

Maritz CX Xcel Energy

Large Satisfaction Gap Exists Between Digital and Non-Digital

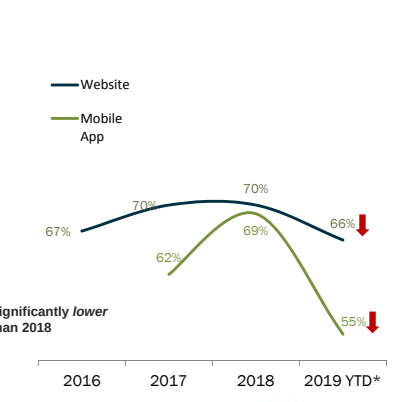
Digital channels are scoring significantly lower than last year, and continue to score significantly below non-digital channels

Non-Digital Yearly Trend - OSAT



*1/1/19 – 9/22/19

Digital Yearly Trend - OSAT

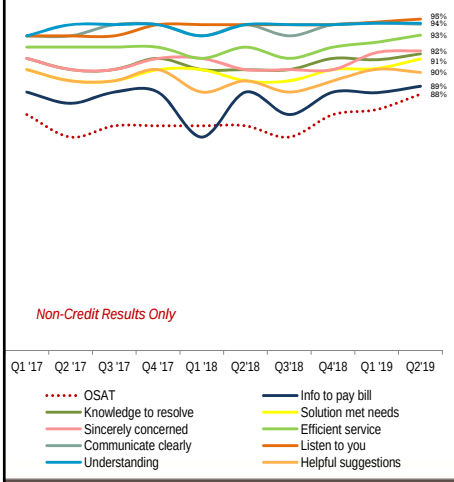


Maritz CX Xcel Energy

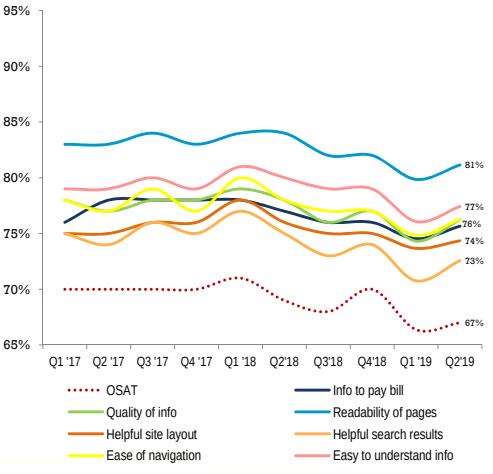
Large Digital Gap Also Exists for Key Attributes

Key attributes from the survey that provide insights to satisfaction performance show that web satisfaction is low across all attributes with the exception of readability.

Agent Experience OSAT & Attributes (Top 3 Box)



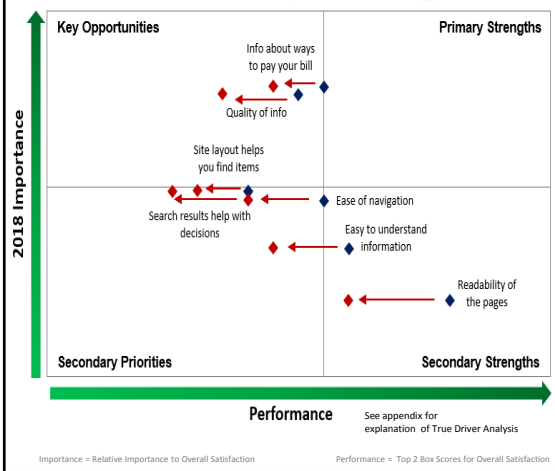
Website OSAT & Attributes (Top 3 Box)



Digital True Driver Analysis: *Website – Total*

Takeaway: As of mid-year 2019, all diagnostics fell below 2018 YE levels for the website. Through late Sept 2019, all attribute scores have significantly declined compared to last year.

Overall Satisfaction with today's visit to Xcel Energy's website



See appendix for explanation of True Driver Analysis

Importance = Relative Importance to Overall Satisfaction

Performance = Top 2 Box Scores for Overall Satisfaction

2018 Performance

2019 Q1/Q2 Performance (no arrows = no change)

Performance (% Top 2 Box)	2018	YTD 2019*
Quality of info	66	62 ↓
Readability of the pages	72	68 ↓
Site layout helps you find items	64	61 ↓
Search results help with decisions	64	59 ↓
Ease of navigation	67	63 ↓
Easy to understand information	68	64 ↓
Info about ways to pay your bill	67	64 ↓

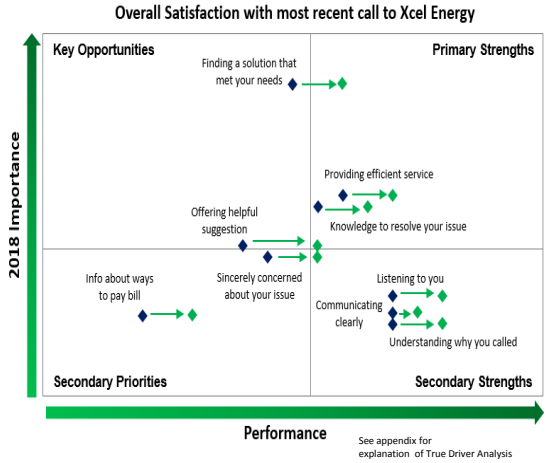
*YTD = 1/1/19 – 9/22/19

↓ **Significantly *lower* than 2018**

Maritz CX Xcel Energy

Non-Digital True Driver Analysis: *Agent Experience – Total*

Takeaway: The Phone/Agent channel continues to perform strongly for the tested diagnostics; as of Q2 2019 there were four primary strengths for this channel.



2018 Performance

2019 Q1/Q2 Performance (no arrows = no change)

Performance (% Top 2 Box)	2018	YTD 2019*
Knowledge to resolve your issue	84	86 ↑
Finding a solution that met your needs	83	85 ↑
Sincerely concerned about your issue	82	84 ↑
Providing efficient service	85	87 ↑
Communicating clearly	87	88 ↑
Listening to you	87	89 ↑
Understanding why you called	87	89 ↑
Offering helpful suggestion	81	83 ↑
Info about ways to pay bill	77	79 ↑

↑ Significantly *higher* than 2018

*YTD 2019 = 1/1/19 – 9/22/19

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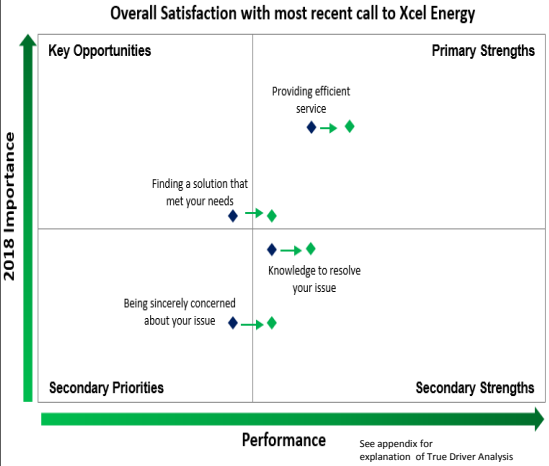
Non-Digital True Driver Analysis: *Agent Post Call – Total*

Takeaway: We have also seen significant improvements in the Agent Post Call Study for all attributes except for Finding Solutions



2018 Performance

2019 Q1/Q2 Performance (no arrows = no change)

Performance (% Top Box)	2018	YTD 2019*
Knowledge to resolve your issue	77	78 ↑
Being sincerely concerned about your issue	76	77 ↑
Finding a solution that met your needs	77	77
Providing efficient service	78	79 ↑

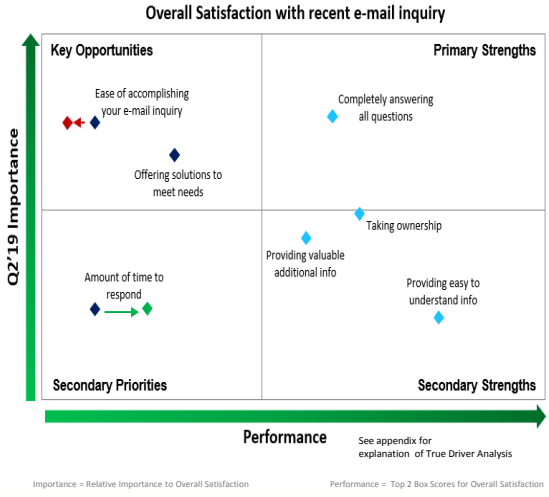
↑ Significantly *higher* than 2018

*YTD 2019 = 1/1/19 – 9/22/19

Maritz CX Xcel Energy

Non-Digital True Driver Analysis: *Email Correspondence – Total*

Takeaway: Timeliness has significantly improved compared to last year.



2018 Performance
2019 Q1/Q2 Performance (no arrows = no change)
New questions added in Q2 2019

Performance (% Top 2 Box)	2018	YTD 2019*
Amount of time to respond	71	74 ↑
Ease of accomplishing task	71	71
Completely answering all questions*		80
Providing valuable additional info*		77
Taking ownership*		79
Providing easy to understand info*		82
Offered solutions to meet needs	74	75

*YTD 2019 = 1/1/19 – 9/22/19
* New survey question added in Q2'19

↑ Significantly *higher* than 2018

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Billing & Payment & Outage: CX Satisfaction

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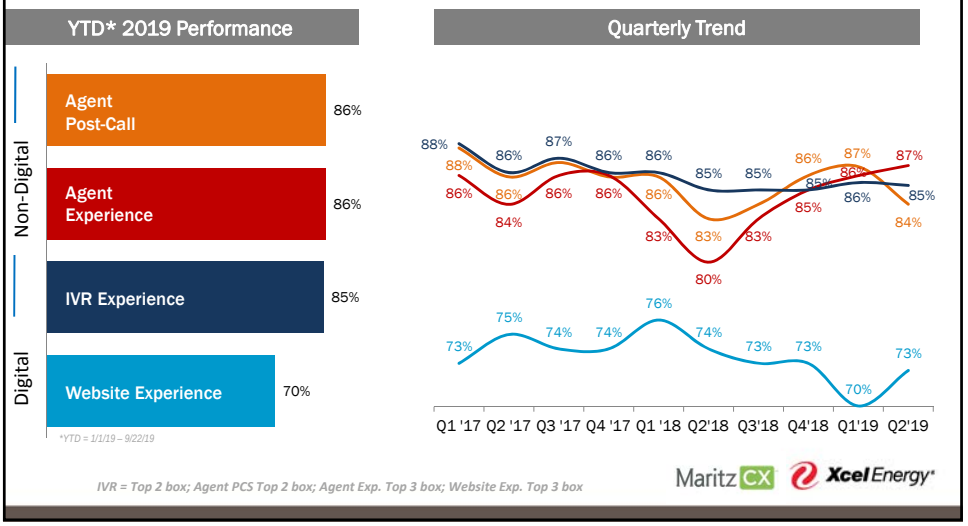
Billing and Payment: Overall Satisfaction

Among billing and payment customers the Website is significantly below Non-Digital channels, with Q1 2019 being the lowest point over the last two years.



IVR = Top 2 box; Agent PCS Top 2 box; Agent Exp. Top 3 box; Website Exp. Top 3 box

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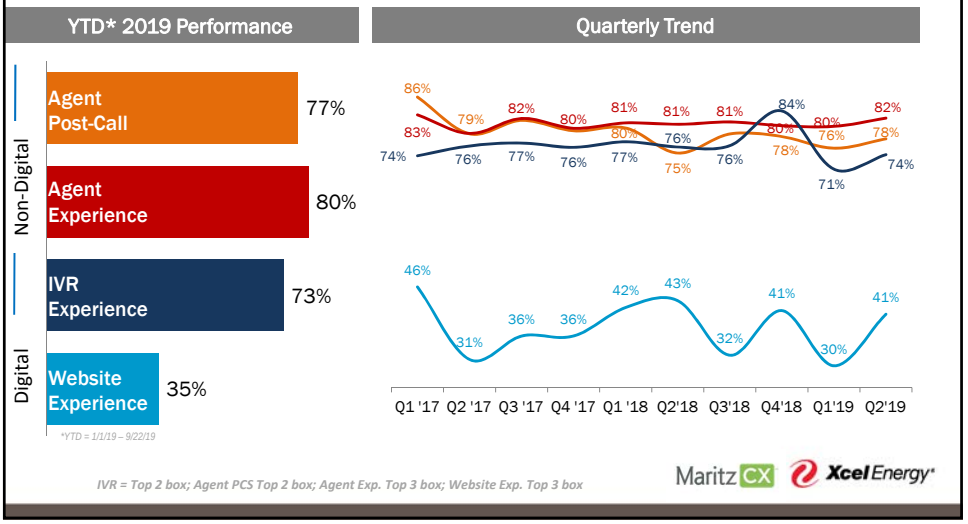
Outage: Overall Satisfaction

Customers that visited the website due to an outage are significantly less satisfied than customers that utilized non-digital channels



IVR = Top 2 box; Agent PCS Top 2 box; Agent Exp. Top 3 box; Website Exp. Top 3 box

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Customer Connection

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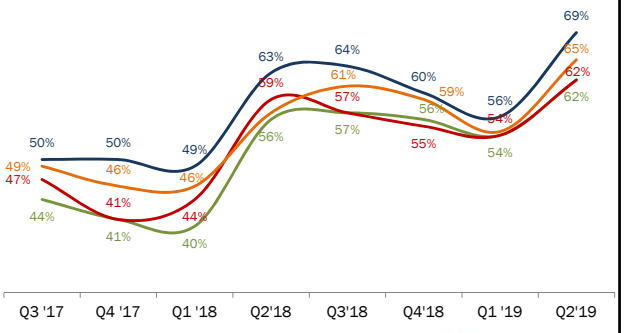
Customer Connection Satisfaction

While scores continue to improve due to efforts by Distribution to identify and correct problems, satisfaction is still relatively low compared to all other channels

YTD* 2019 Performance

Quarterly Trend – Top 3 Box



Maritz CX Xcel Energy

Project Budgeting and Development: the Technology Investment Governance Process

A. Initial project budget development

Business Systems' budget development, project prioritization, and project management leverages an established Technology Investment Governance (TIG) process. As part of the TIG process, key business and IT leaders are accountable for managing demand intake, prioritization, and business outcomes of the IT projects in their portfolios as they move from project inception towards in-service, thereby ensuring that projects comply with IT portfolio and project management requirements. TIG leadership is comprised of executive level and senior business leaders in a partnership with IT leadership. IT works with each business area to determine its specific IT needs, and then these needs are prioritized based on a particular set of factors. Specifically, each Business Systems area is responsible for partnering with a specific business area within the organization to determine that area's long-term strategic objectives, and identify whether IT investments can enable achievement of those objectives. In turn, these priorities are converted into a proposed Business Systems budget. The TIG process also oversees and approves any changes in project scope or budget at the corporate level based on overall Company priorities and spending levels.

B. Converting project ideas into the Business Systems budget

From the idea stage, project ideas are grouped and evaluated, ranked, and selected based on a common set of filters. This process weighs a multitude of criteria including: (1) the financial and non-financial benefits of a project; (2) the potential for other existing technologies to address the business need; and (3) the degree to which the project is needed to meet regulatory requirements or to ensure system reliability and security. This categorization process allows Business Systems to evaluate the benefits and risks associated with each project idea, and results in a list of ranked project ideas.

C. The next step after the project ideas are ranked

Under the TIG process, the Company reviews the ranked project ideas to determine which projects should be implemented and included in the Business Systems budget. This process requires further refinement of the budget figures for each project, and prioritization of possible projects until a final budget is set.

D. How projects are governed once approved for inclusion in the budget

Business Systems employs a "gated" approval process called the "Governance Gates Process" to oversee IT projects throughout their lifecycle. Projects move through specific gates or approvals under the TIG process. The Governance Gates Process enables regular review of project metrics (schedule, scope, deliverables), and institutes corrective action plans or modification as appropriate.

E. The different gates or approvals that are part of the Governance Gates Process

The five gates that each capital project must complete before it is initiated and ultimately placed in service are as follows: (1) Approval to Initiate; (2) Alignment to Design; (3) Alignment to Build; (4) Alignment to Launch; and (5) and Project Closure.

Gate 1: Approval to Initiate

Under the TIG process, if it is determined that a project should move forward, the first governance gate is "Approval to Initiate," which is the official start of the capital project. Approval to Initiate includes a delivery checklist, a stakeholder identification and analysis, an official project plan, risk logs, and operational readiness.

Gate 2: Alignment to Design

The next gate is the "Alignment to Design." The purpose of this approval is to ensure that the initial budget and schedule have been adequately documented since the "Approval to Initiate" gate, and that the strategy is appropriately developed to move the project forward.

Upon approval of this gate, the project profile, requirements, security project risk assessment, budget, and schedule are assessed and modified as appropriate.

Gate 3: Alignment to Build

The next gate is "Alignment to Build." This approval provides the final check of a project before construction begins to ensure that the proposed design meets the

identified needs and any technical problems are resolved.

At this gate, the project is reviewed and validated by the Architecture Governance Panel (AGP) to ensure that the project satisfies its intended business objectives. Overall project status, technical solutions, software products, documentation, and definitive estimates are reviewed to ensure completeness and consistency with design standards and to resolve any technical issues with the project. After an AGP Decision is obtained at this gate, the project team will begin to build and deploy the project.

Gate 4: Alignment to Launch

The next gate is "Alignment to Launch." This is a formal inspection also conducted by the AGP to determine whether the technology solution is ready to be placed in service. The business unit sponsoring the solution must also approve the project at this stage, and confirm that it meets the business unit's objectives, and that the operational procedures and tools (such as user training) are in place to ensure its successful and secure operation in the production environment.

Gate 5: Project Closure

The final gate is "project closure." This gate is the formal close out of the project verifying the solution has been transitioned to operational steady state and storing all project artifacts.