

EBOOK

# West Monroe's guide to Advanced Distribution Management System (ADMS) deployment for electric utilities



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# Introduction

**Y**ou're considering a new Advanced Distribution Management System (ADMS) approach or have already begun down the path. Perhaps you've started your journey and made investments along the way or are trying to determine your next move. But how do you get the full value from such a major investment?

ADMS may be new to your organization or short of full implementation, which can cause challenges in making the right decisions, coordinating internal and external resources, and determining long-term investments. There are multiple stakeholders across various departments who need a common vision, a collaborative culture, and to be guided by a mentality of continuous improvement. In an increasingly digital world where people expect to have quick access to information, business success is directly tied to embracing new technologies that improve delivery to customers and make organizations more efficient.

You have a control center to run, a department to manage, and information to protect. We understand that, which is why we wrote this resource to offer practical and pragmatic advice to help you navigate the ADMS path forward. In the following pages, you'll learn:

- How to create alignment among senior leadership with a strategic plan, business case, and key performance goals
- How to get started planning for an ADMS program
- How to overcome common challenges and objections that impede success
- Key project considerations across the technical design and deployment of ADMS technology
- How to strategically identify additional value and long term ADMS strategies

## WHY ADMS?

Management of the grid becomes more challenging each day. The distribution network is becoming progressively more dynamic, complexity is increasing, and the volume of data that utilities need to understand and integrate continues to grow. What used to be a simple one-way power flow from large generation plants into rate payer homes is fast becoming a two-way, distributed and dynamic energy ecosystem. Now is the time to continue investing in the advanced technologies that make it possible to respond to the increasing amounts of distributed battery energy storage, community solar, microgrids, electric vehicle charging stations, rooftop solar, home batteries, and other technologies that are changing the old model of the one-way distribution grid.

With these new technologies gaining more traction among consumers, utility leaders are facing new challenges not just with two-way power flow but also with quality, reliability, and affordability. In order to manage these changes, utilities are investing heavily in modernizing their grid with what is now known as ADMS: Advanced Distribution Management Systems.

ADMS are typically a platform consisting of the combination of traditional utility Supervisory

Control and Data Acquisition (SCADA) and Outage Management Systems (OMS) and newer advanced applications built on top of a real-time network connectivity model.

By integrating these applications into a single platform, the ADMS technology leverages that real-time connectivity information to run advanced applications such as on-line power flow, Fault Location, Isolation and Service Restoration (FLISR), and Volt/VAR Optimization (VVO). In addition, this more complex data model enables DER integration if DER are correctly modelled/forecasted on the network connectivity model, which forms the basis of the grid operations component of DERMS (Distributed Energy Resource Management System).

The implementation of these systems can lead to tremendous business value. Typical outcomes include:

- Improved reliability (FLISR, improved OMS functionality)
- Energy efficiency (VVO, CVR, demand response)
- Streamlined operations (O&M improvements)
- Increased situational awareness

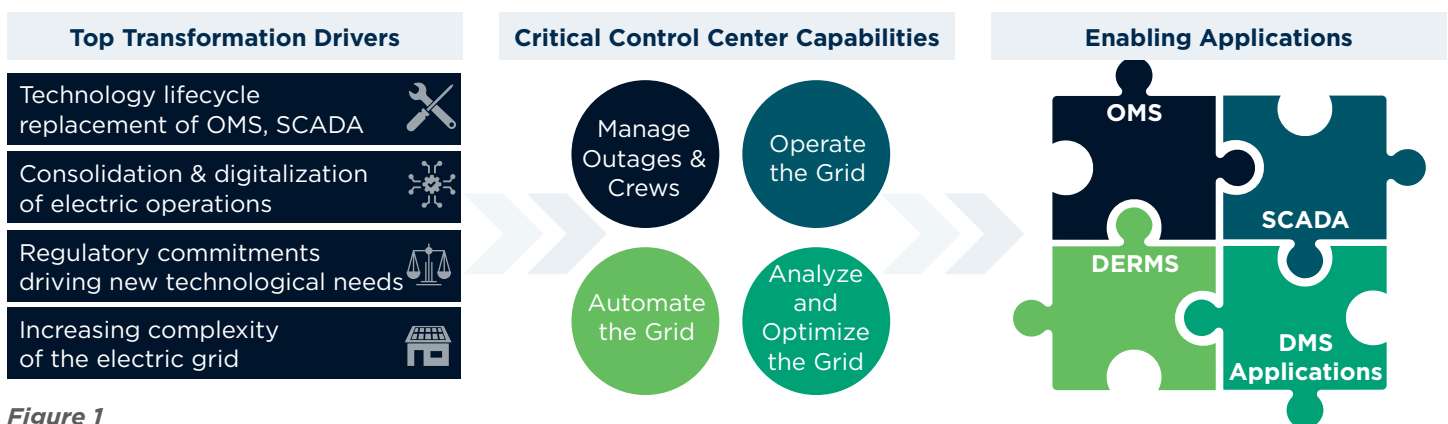


Figure 1



## The Grid is Evolving, and New Approaches are Needed

Utility control centers traditionally have focused around two key technologies: OMS to manage planned and unplanned outage events, and SCADA to remotely monitor and operate the grid. Up until recently, these technologies were typically not integrated and sitting on different networks (IT vs. OT). But the need for more granular real-time understanding of grid status is driving utilities to change.

A core capability of the distribution utility is to maintain accurate knowledge of the current state of the grid, referred to as the “as-switched” or “as-operated” network model. Depending on utility needs and investments, the awareness of their grid may have been limited as well, with a basic connectivity model informing OMS functions and manually drawn diagrams for SCADA purposes. Many utilities leverage physical maps with tacks or other solutions to maintain an understanding of this “as-switched” state. Digitizing this process results in a critical new data set to use in real time—the as-switched network model state.

The as-switched network model data is critical to accomplishing more advanced functionality for grid operations because without knowing how the grid is configured at any given moment, algorithms and automation functions may not provide accurate insights or actions and result in suboptimal performance or even safety issues.

Insight and control over the real-time state of the electric grid is the key value ADMS unlock.

## FOUR MAIN DRIVERS PROPELLING UTILITIES TOWARDS ADMS

### 1 | Technology lifecycle replacement

- Many OMS and SCADA platforms are approaching end of lifecycle
- Technology capabilities have progressed significantly since current system architecture was implemented
- Cybersecurity continues to be a critical issue for utilities as requirements evolve

### 2 | Ongoing digitization of electric operations

- Utility operations technology typically relies on many manual and paper-based processes
- Many utilities are moving to consolidate control center locations, processes, and technologies
- Technology solutions implemented in the past may be creating a maintenance challenge and forcing “swivel chair operations”
- More data is being generated and more control technology is being deployed than ever before, requiring new tools to manage effectively

### 3 | Regulatory changes driving new requirements

- In states with progressive regulators pushing for grid modernization initiatives, ADMS are being looked at as a key aspect of utility grid modernization programs
- In states with significant regulator push on energy efficiency, ADMS are being considered to enable VVO-type energy efficiency measures
- Additionally, utilities are looking at ADMS-based FLISR automation to increase reliability performance

### 4 | Increasing complexity of the grid

- Distribution DER causing two-way power flow, phantom load, and protection challenges for operations
- Distribution DER causing impacts to transmission system or requiring communication to transmission ISOs
- Increasing customer expectations for reliability, effective communications, and interest in clean energy
- Increasing amounts of sensors and data available leading to data overload
- Climate change and increased severe weather events are uncovering shortcomings in utilities’ current outage restoration activities and need for increased resiliency

## BARRIERS TO SUCCESS

ADMS are complex (but achievable!) solutions to a complex problem. This is not off-the-shelf software, and utilities cannot expect to simply flip a switch and experience the benefits. A comprehensive strategy must be put in place to understand gaps in key areas and make targeted investments in foundational enabling technologies that the ADMS needs to be successful.

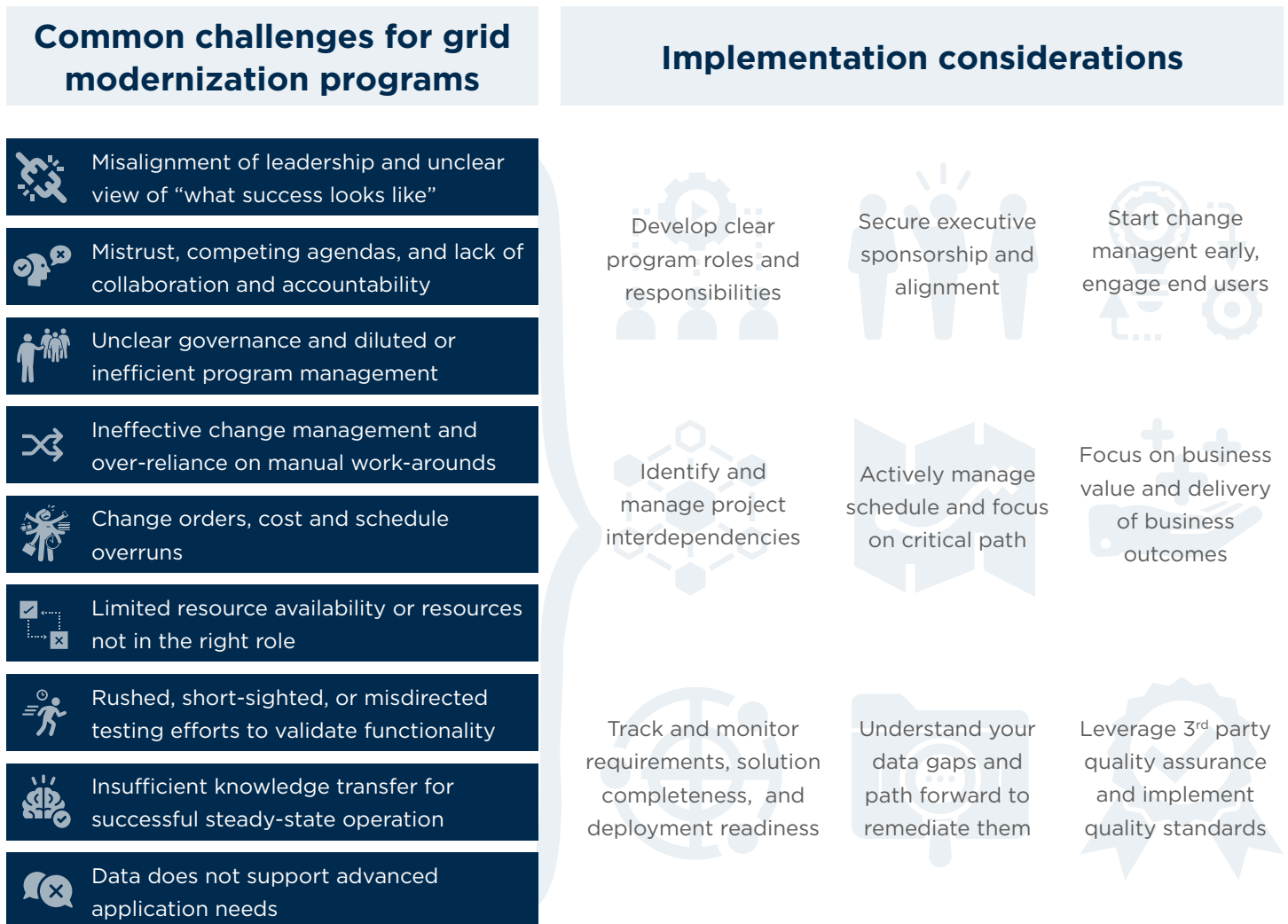


Figure 2

This includes the following:

AREA OF INVESTMENT	DESCRIPTION	EXAMPLES
<b>Smart Equipment</b>	Sensors and apparatus required to receive data from the field, and operate the grid. Some level of distributed intelligence for decisions that don't require a "big picture" view	Smart Meters, Distribution Automation (DA) equipment, Substation automation equipment, Sensors
<b>Communications</b>	Without communications infrastructure, utilities cannot interact with their smart equipment investments	Advanced Metering Infrastructure (AMI), Field Area Network (FAN) Fiber, Telecommunications
<b>Data</b>	GIS, planning, customer and other data sets feed into the ADMS to create the network model representation, and other data may be shared in day-to-day operational processes. Understanding data requirements early can help avoid potential issues later in the process i.e., inability to accurately analyze network details for advanced apps	GIS network model data, Customer connectivity / usage data, Asset engineering data, Customer load profiles, EMS station models
<b>Systems Integration</b>	ADMS requires integrations across OT and IT, to critical systems such as CIS, GIS, MWFM, EMS and requires program capabilities to plan and oversee implementation of SI	CIS, GIS, MWFM, EMS, IVR, Smart Meter / AMI, Planning, DA, SA, EAM, Weather integrations
<b>Governance</b>	Hard decisions will be made over the length of the program, and the governance to facilitate decisions, assign accountabilities, and keep the program moving is critical	Leadership ownership, PMO, Dashboards
<b>Change Management</b>	ADMS modernizes grid operations and requires careful attention to be paid to training and managing change throughout the program	Leadership alignment, Employee engagement, Training, Change readiness, Procedures

## Planning for an uncertain future

While the implementation of the ADMS platform itself can be a challenging endeavor, these challenges can be multiplied by the immense evolution of the industry. You may struggle balancing day-to-day needs with long-term capabilities and lack of clarity of what the true future state operating needs may be.

You're not alone. Many ADMS projects struggle to deliver a functional system on time, on budget, and on schedule while grappling with evolving policy, technology, people,

and operational environment. The technology itself will deliver certain key capabilities required to operate the grid of the future, but the effort to truly digitize operations extends past the platform implementation.

This complexity underscores the criticality of developing an overall DER/grid modernization strategy and governance to drive corporate transformation, and all the other moving pieces required to truly digitize grid operations as well as organizational agility to adapt as new regulations, technologies, and challenges surface.

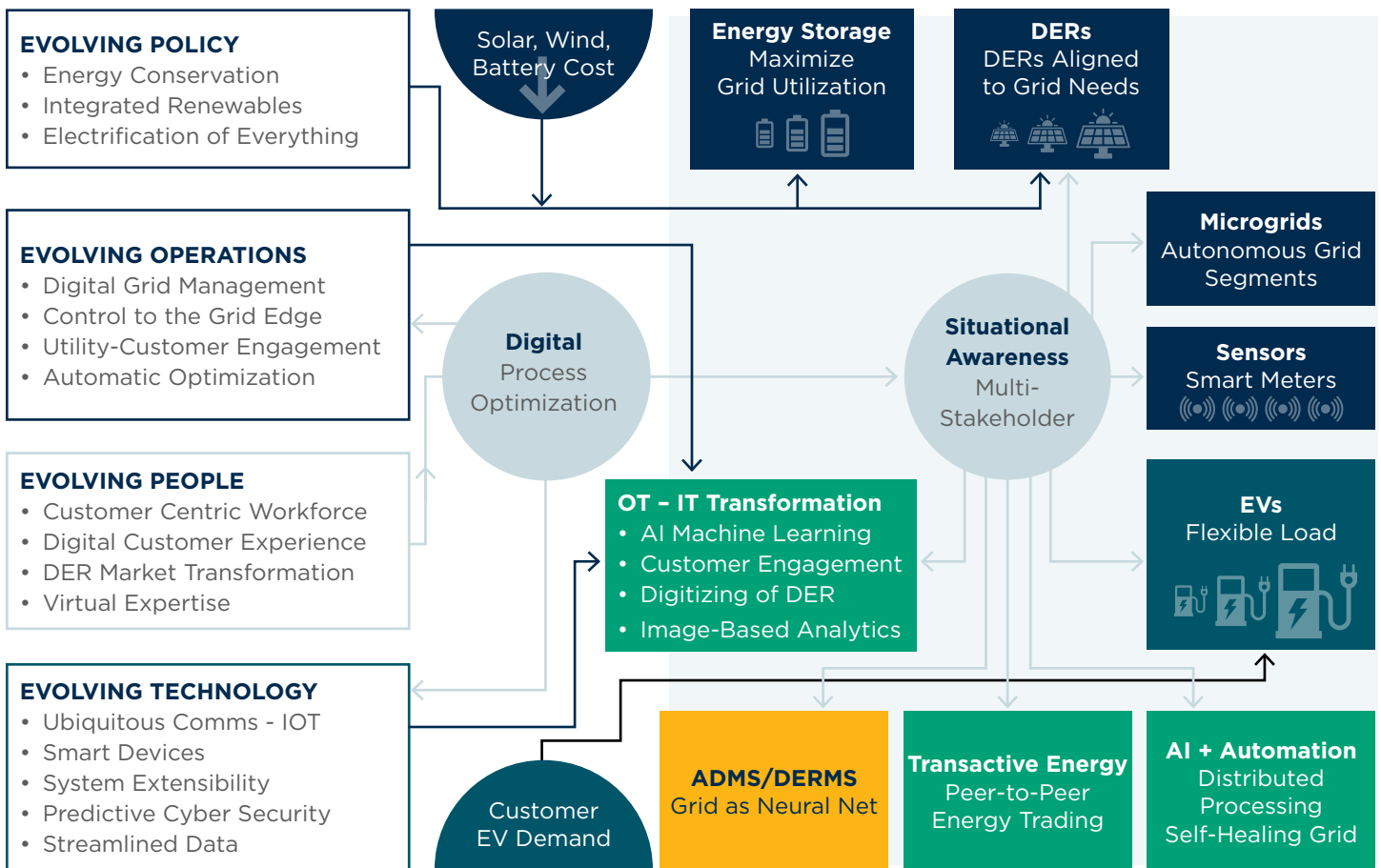


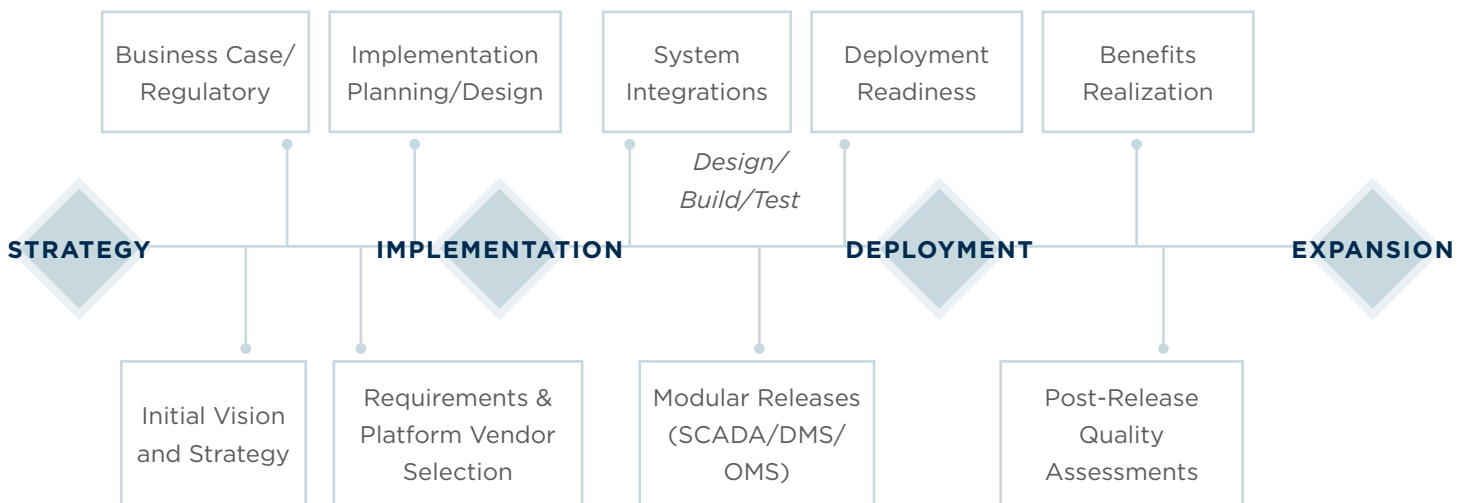
Figure 3

## THE ADMS PROJECT LIFECYCLE AND WEST MONROE'S SERVICES

West Monroe provides its clients with support across the full lifecycle of ADMS programs, from initial strategy to benefits realization. Our experienced team leverages cross-functional expertise and business focus to set our clients up for success and lean-in during implementation to deploy solutions that deliver on business value.

### Methodology

West Monroe has consulted with utilities around the country on implementing successful ADMS programs. The following playbook comes from our aggregated learnings over the last decade of providing support on building business cases, securing regulatory approval, choosing the appropriate vendors, making tailored recommendations, and overseeing program implementation through the coordination of people, process, and technology.



Once installed, there is significant work to optimize OT/IT to support high penetrations of DER – West Monroe’s Digital DER solution helps utilities pull together technology and processes to support this transformation effectively

Figure 4



◆ PART 1

# Getting Started



## ◆ CHAPTER 1

# Defining the strategy for leadership alignment

## OBJECTIVE

*Define the strategic vision underpinning an increased investment into ADMS—what will be achieved, how you will measure success, and why now is the right time to make moves—in order to create alignment and get buy-in from top leadership.*

**T**he complexity and cost of the procurement, integration, and deployment of an ADMS system requires a thorough strategic roadmap to ensure alignment among senior leadership and lay the groundwork for success. The decision to deploy ADMS is a strategic initiative that must be championed at the highest level in the organization and aligned with the organization's long-term vision.

Moving to ADMS fundamentally changes how a utility operates, and without buy-in across the organization, efforts to accelerate adoption will be hamstrung. Alignment is key. Create it by clearly defining the strategic vision and how it will be achieved. You must ask and answer questions like:

- Why is ADMS needed?
- What value does it provide?
- What will be required of leadership stakeholders to make the investment successful?

Define specific key performance metrics, a clear measurement schedule, and reporting process to ensure the project is on track. A good strategy roadmap should have a realistic timeline of all major activities such as RFP creation, vendor selection, and operational change management. You should be doing plenty of research at this stage—interview other utilities on their own upgrade journeys, engage vendors with questions, and take part in platform demos. Gather information to craft a clearly defined vision of a future with ADMS and the benefits and results that can be experienced.

## ALIGNMENT GOALS

- Define a strategic vision that promotes stakeholder buy-in and prevents issues down the road
- Ensure utility leaders have a thorough understanding of the objectives and benefits of the program and can act as champions throughout the organization
- Propagate a common understanding of the vision throughout the organization to align teams and activities

## HOW TO ACHIEVE LEADERSHIP ALIGNMENT

- Form a steering committee with clear sponsorship to guide efforts throughout the phases of the ADMS lifecycle
- Pay attention to where there may be resistance and then proactively engage those departments in conversation
- Consider governance structure and leaders for sponsorship roles to drive the change
- Understand high-level funding and budget parameters
- Factor in the need for external resources to support the program
- Build a vision around your utility's specific value drivers (e.g., increased reliability/resiliency, energy efficiency, DER integration)

## ◆ CHAPTER 2

# Structuring an ADMS program

## OBJECTIVE

Document a plan for how you will structure your ADMS program (e.g., Program Management Office (PMO), Business Integrator (BI), System Integrator (SI), Product Vendors, Quality Assurance) and what the governance structure will look like.

A well-conceived personnel program and governance structure provides the controls, organization, and decision-making processes required for successfully managing through the challenging nature of ADMS deployments. A

thorough personnel plan ensures representation from IT and business unit teams who need to be bought in from the beginning. Further, by identifying which roles will participate internally and where third parties will come into the picture, you reduce the likelihood of redundancies or misunderstandings down the road.

The best program structures we've seen have roles carved out for leaders and project team members who are solely dedicated to ADMS rollout; projects that are this complex and long term in scope benefit greatly from the focused attention of professionals who don't have to worry about balancing day-to-day operational needs.

### TYPICAL KEY ADMS ROLES

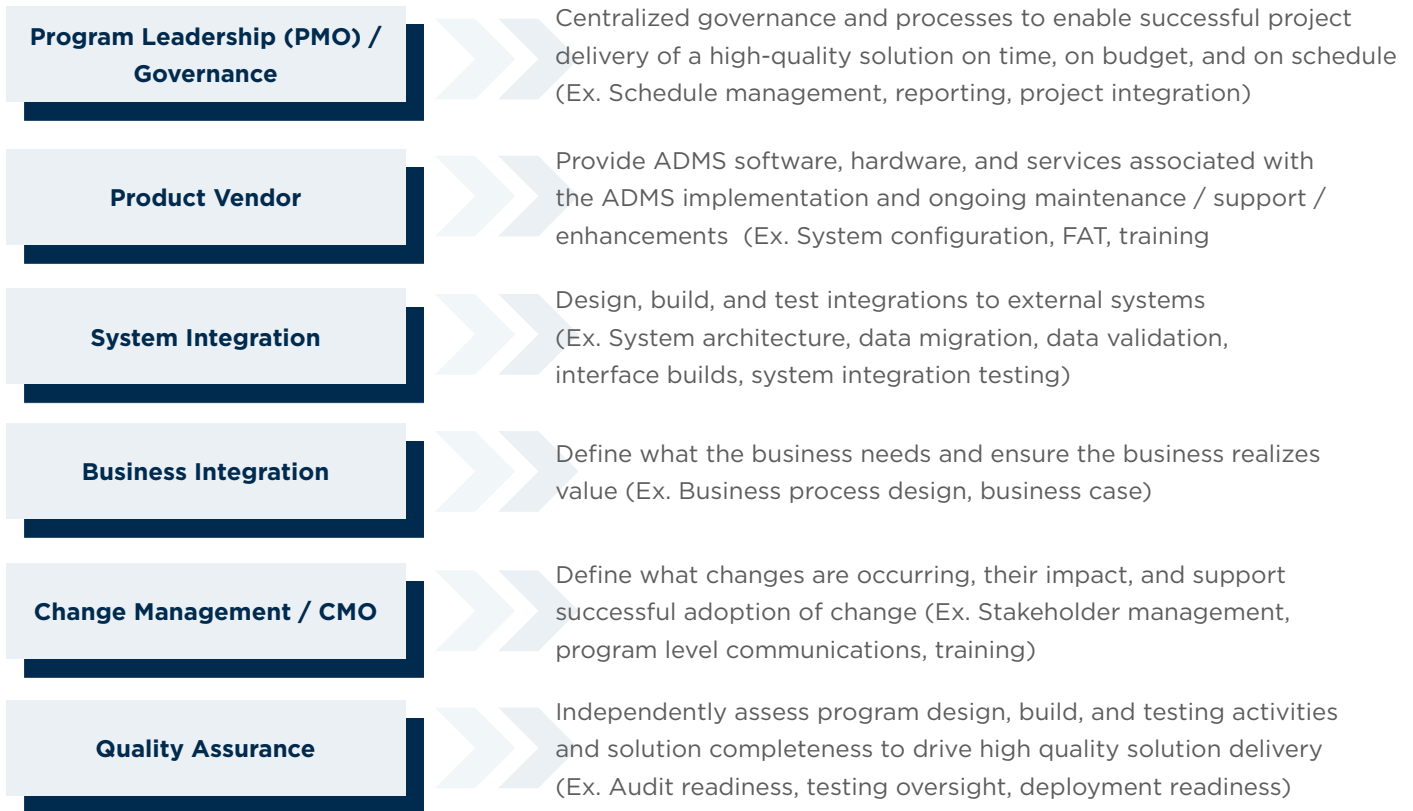


Figure 5



## PROGRAM STRUCTURE AND GOVERNANCE GOALS

- Create a framework to ensure that important decisions and their associated risks are discussed and tracked before actions are taken
- Act as a centralized body with representation from different stakeholder groups; a governance board helps individuals know who plays what role and who to consult on certain decisions
- Ensure that the alignment achieved at the beginning is maintained as multiple stakeholders remain engaged and bought in to the ADMS vision

## HOW TO CREATE STRUCTURE

- Clearly define the capabilities that can be handled by internal staff vs. what will require support from third parties
- Create a central governing committee with representation across all key business and technology units
- Plan for a dedicated cross-functional implementation team to increase likelihood of success

## ◆ CHAPTER 3

# Developing an ADMS business case

## OBJECTIVE

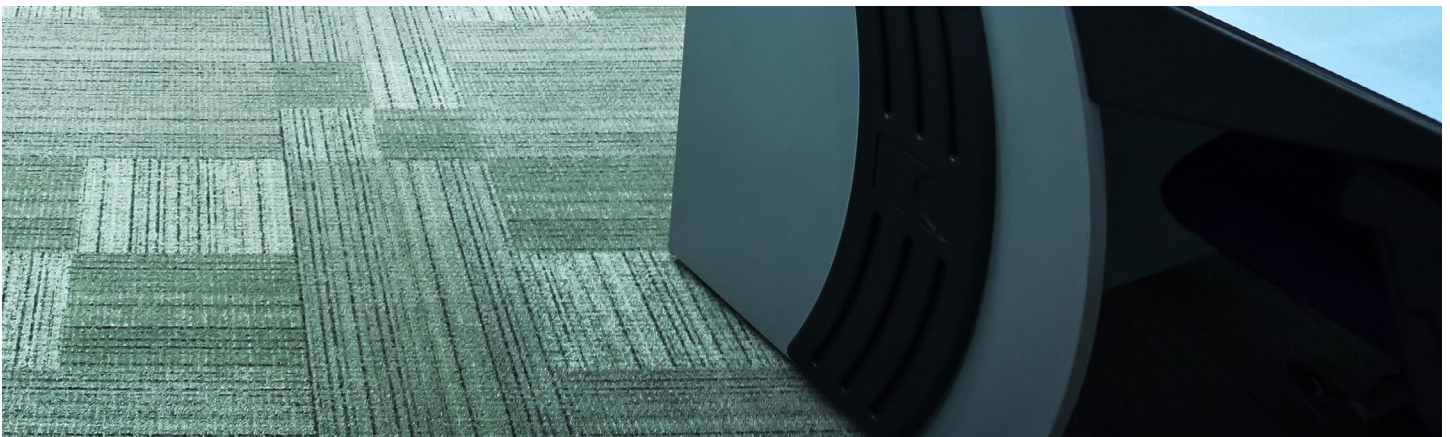
*Develop a business case tailored to your specific utility's need and funding pathway.*

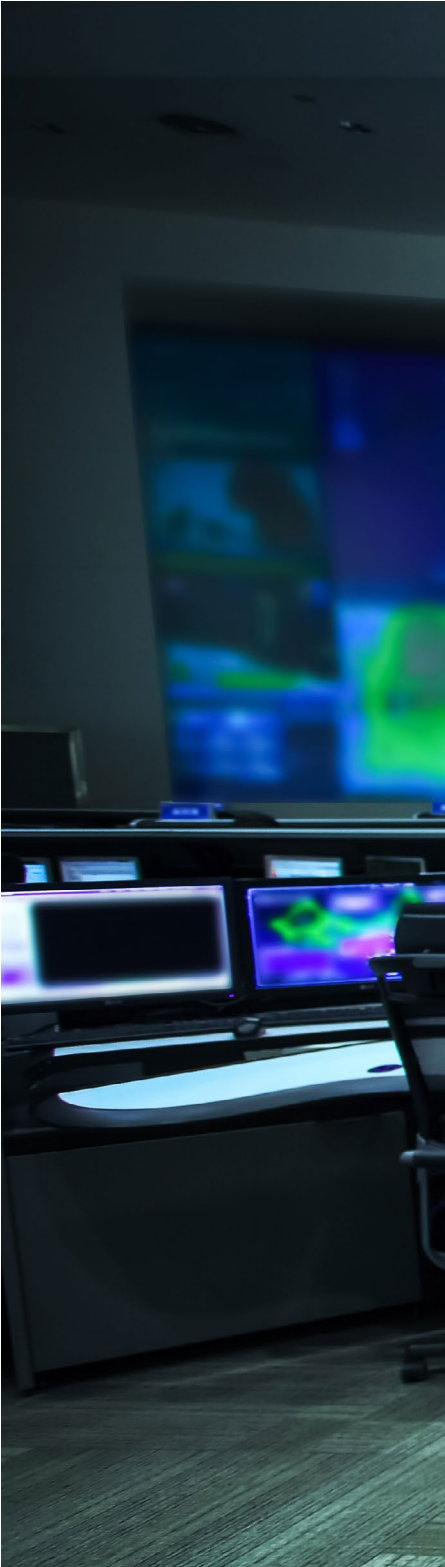
Some utilities take a phased approach and treat ADMS investments as part of the regular technology lifecycle upgrade process. Others justify higher levels of investment through regulatory channels to achieve energy efficiency or reliability goals. In either case, a specific business case that quantifies benefits where possible and clearly articulates added value is essential.

A well-prepared business case underpinned by financial drivers not only helps create alignment on the shared vision but also is critical to securing funding for the investment. The more quantifiable terms that are included, the stronger the business case becomes. When possible, use real-dollar figures and projections to quantify benefits and O&M costs. In a business case aimed at regulators, you need well-defined assumptions on annual escalation rates, discount rates, and avoided cost projections.

## BUSINESS CASE GOALS

- Provide the justification for the project and help serve as a guide throughout the project to assist in critical decision-making
- Create alignment between the business case and the regulatory filing to make a strong case for approval
- Provide clear insight into quantifiable value achieved by the project and basis for future benefits realization activities





## HOW TO CREATE THE FOUNDATIONAL BUSINESS CASE

- Detail the costs for hardware, software, and resources
- Treat each integration like its own project and estimate the costs, including the effort on the utility side of the integrations
- Be aware that various hardware costs can include both servers for the data center or centers as well as any upgrades for the devices in the field; field costs could require separate devices and maintenance that can increase costs
- When pricing vendor software, ensure any desired advanced modules are included in the original bid or scoped out (e.g., VVO, FLISR, training); additional software costs may include OMS and GIS upgrades
- Both internal and external resources should be worked into the business case and be considered at all phases of the ADMS lifecycle, from planning to implementation
- Keep in mind that internal resource costs can vary from new hires that are needed to manage the system, training costs, and the different resources/departments whose time will be required for planning and implementation; external resources can include PMO, SI, OCM, and solution architects
- All benefit realizations should be identified throughout the planned implementation period: Quantifiable savings for features or advanced applications like VVO and FLISR will largely impact how your business case is received by the regulatory commission
- Consider upfront process work to identify potential efficiencies, improvements, and pain points to address during the project

◆ PART 2

# Technical implementation



## ◆ CHAPTER 4

# Creating solution architecture

## OBJECTIVE

*Map the interdependent, connected operations of the grid to define the scope of the ADMS implementation.*

**A**t this point, you will have identified your operational goals and business case to form a thorough understanding of what you want the system to accomplish. With that in mind, consider the technological components of the typical ADMS system alongside your current infrastructure to identify how your hardware and software will interact. By creating a solution architecture, you are answering the following questions: What do we want the system to do? Where will it sit? How does it integrate? Where does data need to be collected from and sent to?

A solid foundation in GIS-enabled network connectivity will provide you a head start when it comes to building effective solution architecture. In our experience, this is a necessary precursor for implementing a system that works and maximizes your value. From here, you will be in a better position to roll out more advanced systems like power-flow monitoring, FLISR, distribution state estimation, and onboarding DER assets. With that foundation in place, you'll be able to understand where advanced capabilities are needed, how they need to be worked in, and what the result will be.

An effective solution architecture also identifies risks and gaps—and having identified them can help you plan for mitigations. This is arguably the most important phase of the process as it determines how well and efficiently a project will run. Most ADMS programs struggle because risks are not identified during the design phase, leading West Monroe to develop the ADMS Interdependency Framework (AIM).

## SOLUTION ARCHITECTURE GOALS

- Analyze required interfaces and expected data flows in your ADMS implementation program
- Identify and mitigate interdependency risks
- Communicate expectations among grid operators
- Ensure ADMS program execution is set to succeed

## HOW TO ACHIEVE SOLUTION ARCHITECTURE RESULTS

To realize its full potential, ADMS must be integrated into other operational and corporate systems. It will utilize GIS, grid connectivity model, and telemetered data from field devices to monitor the current configuration of the grid as well as all other possible integrations with the distribution system. For example:

- Integration with AMI meters will enable the grid's sensing capabilities to notify the engineers when customers are experiencing an outage, flickering lights, open neutral, or power quality issues
- Integration with DERMS can provide demand-side DR/DER flexibility for local grid services like reserve capacity, power quality, and frequency
- Integration with existing EMS for coordination with transmission operations
- Integration with CIS and customer relationship management system for customer data
- Integration with grid planning and interconnection applications to support hosting capacity analysis and inform grid model characteristics for power flow and DERMS
- Integrations with third-party data providers such as wind and solar forecasting vendors

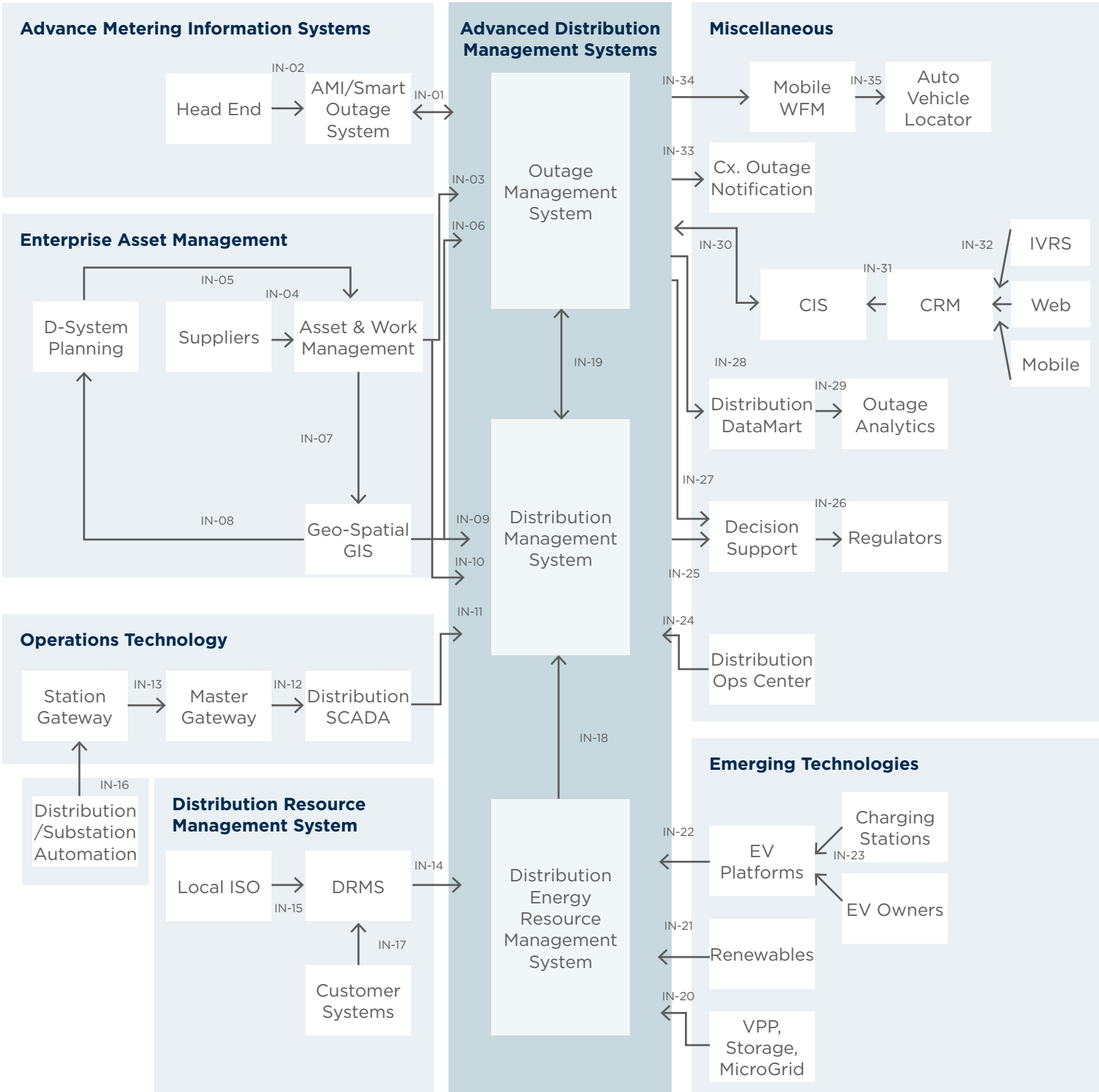


Figure 6— Conceptual ADMS/Integration Architecture

## ◆ CHAPTER 5

# Defining technical and functional requirements

## OBJECTIVE

*Develop specific use cases to further define the detailed technical and functional requirements that will determine how your system architecture works in practice.*

**G**aining the full picture of functional, non-functional, and technical requirements consists of developing high-level business processes, use cases, and detailed user stories. Exploring how new systems work in granular detail will reveal the set of people- and process-oriented requirements you'll need to address.

The best way to begin is to take stock of the overall portfolio of operations technology where ADMS will be applied and build a list of possible information flows that might be expected as part of the integration. Once likely points of data exchange become clear, you can more easily conceive of the broad use cases and the detailed user stories needed to understand the macro and micro requirements that an ADMS system application demands.

In order to flesh out the level of detail needed to create valuable user stories, make sure to socialize these plans with the right operational and technical personnel within your organization. Get their buy-in and ask them how various scenarios would play out from the vantage point of their particular position. Each use case must be reviewed with the product vendors up for consideration. What sorts of needs, risk factors, and on-the-ground realities must be factored into the customized solution? Can that particular vendor provide what you need?

Never forget cybersecurity as a critical component of gathering technical and functional requirements—for the system to work well it needs to not be vulnerable to attack. Onboard your cybersecurity group early during this phase to review application servers, firewalls, field data centers (NERC/CIP in case of EMS) and corporate data centers. Based on our experience, a structure that houses ADMS in data centers separate from corporate data—and protected by independent layers of firewalls communicating from limited, secure ports—is a good way to go.

## TECHNICAL AND FUNCTIONAL REQUIREMENT GOALS

- Validate network models and effectiveness of GIS application to provide timely, accurate location data to ADMS
- Identify core and advanced features in ADMS products
- Determine internal and external dependencies (e.g., any major upgrades, enhancements in-flight in source systems)
- List legacy application technologies to be integrated with ADMS
- Document volume of data exchanges, encryption requirements from cybersecurity, any performance considerations, and what will it take to service-enable each application
- Gain buy-in on integration from source system owners



## HOW TO DEFINE TECHNICAL REQUIREMENTS

Here, we'll illustrate a typical process a utility can follow to develop functional and technical requirements for ADMS implementation, non-functional requirements like performance, high availability, fail over, availability, and integration requirements.

Ultimately, the process depends on the maturity of the utility's IT department, back-end system capabilities and chosen product. However, the basic steps will be similar:

1. Develop business process for core ADMS features
2. Develop business process for advanced ADMS features
3. Build the business requirements and use cases
  - a. If doing in agile develop epics, features, and user stories
  - b. Including requirement traceability matrix
4. Create high-level technical design document
5. Create the sequence diagrams
6. Build the ADMS product and core operations product domain model
7. Create interface design document
8. Design the messages based on organization's architecture best practices like SOA or Webservices or file-based interfaces
9. Design and develop the interfaces
10. Document functional, non-functional, end-to-end integration testing, performance testing, high availability and fail over testing
11. Identify set of use cases for user acceptance testing (UAT) and stakeholders who will be involved in performing UAT
12. Maintain end-to-end cycle in project management tools like JIRA, ServiceNow, Azure DevOps, Rally, etc.

## ◆ CHAPTER 6

# Selecting a platform vendor

## OBJECTIVE

*Follow a formal methodology to ensure an effective RFP process and a well-informed vendor selection to minimize risks of additional costs and delays and maximize the likelihood of success.*

Selecting a vendor for ADMS solution technology and implementation know-how can be daunting. This is a purchase that represents millions of dollars and a partnership potentially spanning decades. Mistakes during vendor selections carry costs that sting. But if you've committed to a thorough effort to investigate and document all the previous steps, you will be well-positioned to put together and run a strong RFP and evaluative process.

The RFP will need to include all of the work you've done: identifying the overall goals of the ADMS program, the blueprint of existing and new system architecture that will need to be in place, and detailed technical and functional requirements of what will be needed to work well.

Earlier, when you were first defining the larger scope, our recommendation was to look at providers and take part in a few demos to get familiar with overall products and offerings. Now, when you're at the stage of evaluating RFPs, you'll want to make sure that every detailed technical requirement of flagged risk can be addressed by either off-the-shelf or customized products by that particular vendor. It also helps to have as defined a scope as possible (informed by your previous planning) to avoid expensive new program additions halfway through your implementation costing time and money.

Some utilities engage consultants like West Monroe before or at this stage of the process. From the consultants' perspective, we're product-agnostic and use our experience with other utilities and system integrations to help organizations that are navigating ADMS vendor selection for the first time.



Figure 7

## GOALS FOR SELECTING AN ADMS PLATFORM VENDOR

- Create a strong RFP that clearly articulates a vision of what success means for your particular utility and specific requirements with a high degree of specificity
- Include details on the conceptual architecture and implementation
- Ensure prospective vendor partners can meet all requirements

## HOW TO OPTIMIZE YOUR RFP AND VENDOR SELECTION PROCESS

This is an example of a comprehensive framework to craft a strong RFP and run a thorough evaluative process for vendor selection:

- Identify the future state operational needs and business requirements for ADMS product
- Review and align the business requirements with the original ADMS business case
- Define functional and technical requirements for each ADMS module
- Create a comprehensive RFP package and issue RFPs to product vendors
- Facilitate meetings with project bidders and for in-depth questions-and-answer sessions with product vendors
- Objectively define bid evaluation criteria and communicate to vendors and, if required, conduct workshops to ensure vendors are aligned with your goal and objectives
- Collect and score vendor RFP responses from short-listed vendors, using an objective and comprehensive evaluation criterion
- Prepare product demo scripts aligned with your product roadmap for the onsite vendor show-and-tell sessions
- Evaluate vendor product demos, evaluation, and final selection using a set of prescribed demo scripts, a subset of utilities data like GIS, OMS, and DERMS to ensure alignment with key operational use cases
- Final vendor scoring, selection, and vendor notification

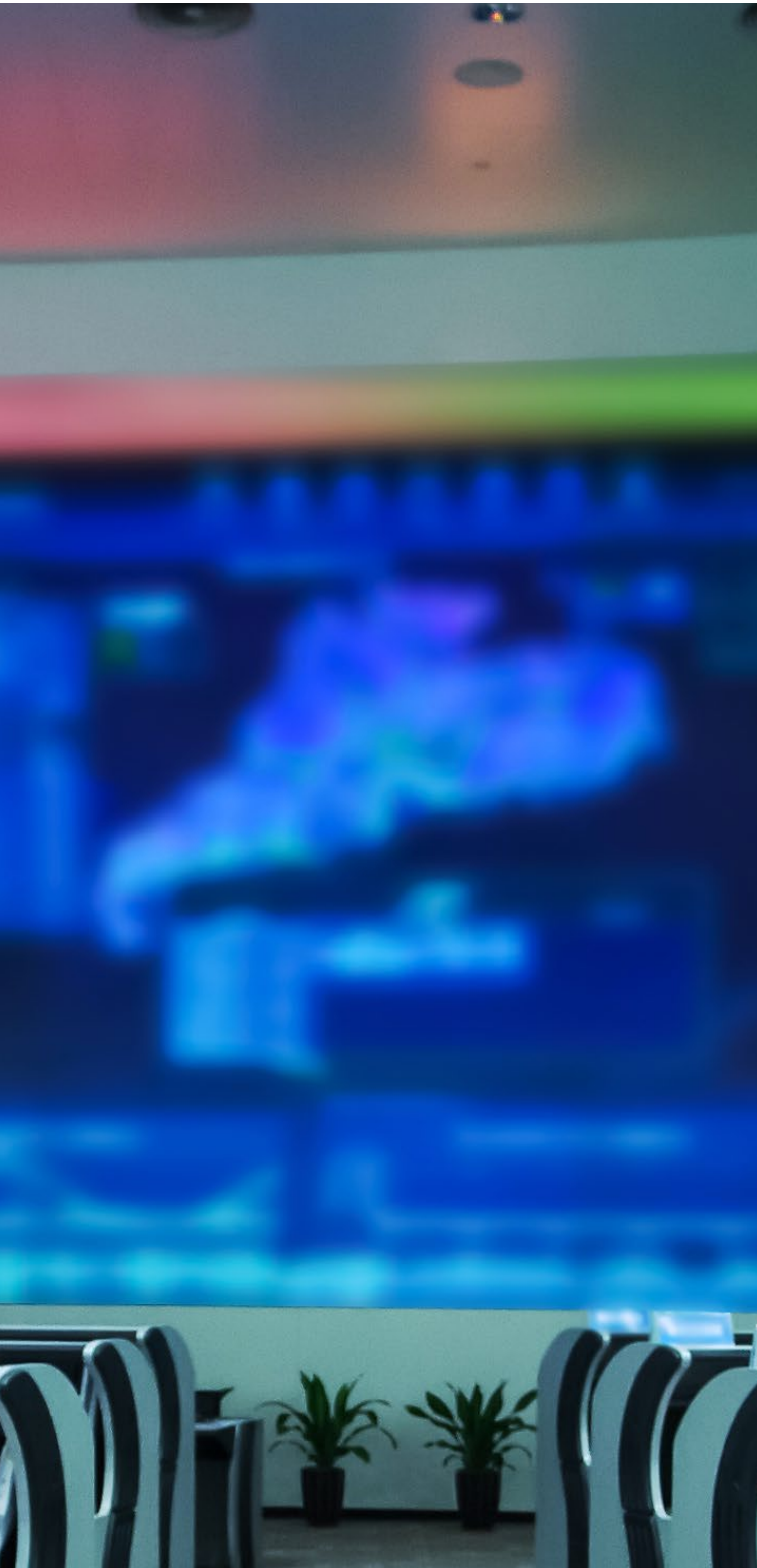
◆ PART 3

# Successful deployment



## ◆ CHAPTER 7

# Instilling project management rigor



## OBJECTIVE

*Keep your program on time, on budget, and hitting milestones with a formal, structured approach to project management.*

So far, we've discussed the heavy investment, long time horizons, and number of stakeholders needed to effectively organize around the ADMS program goals and roles. Once the system architecture is defined, the technical requirements are put in place and the vendor selected, the best way to set yourself up for success is a structured project management framework at the outset. ADMS are not simple off-the-shelf software procurements. It's a system of layered technical and operational capabilities that will significantly alter the way utilities have been running for decades. Put simply, this is systemic change—and it must be managed.

West Monroe's standard PMO approach, which is laid out in this chapter, utilizes a combination of task management structures, communication protocols, customized dashboards, technical hubs, and continual alignment checks to ensure predictable progress towards full ADMS system integration.

Inevitably, there may be unforeseen challenges that cause delays (e.g., hardware supply issues, testing/interface, difficult getting access to certain environments). A central project management framework will help identify issues/risks, assign owners accountable for resolving/mitigating, and document prescribed actions for future risk scenarios.

## PROJECT MANAGEMENT GOALS

- Mitigate risks of project failure and downtime for mission-critical systems
- Create a common framework at the onset of the program built around a PMO to keep all stakeholders on schedule and on task

## HOW WEST MONROE CONDUCTS ADMS PROJECT MANAGEMENT

West Monroe leverages the Obeya visual management framework in the execution of a customizable PMO convergence toolkit. It's continuously maintained and updated based on key learnings, best practices, and hands-on experience across a wide range of industries.

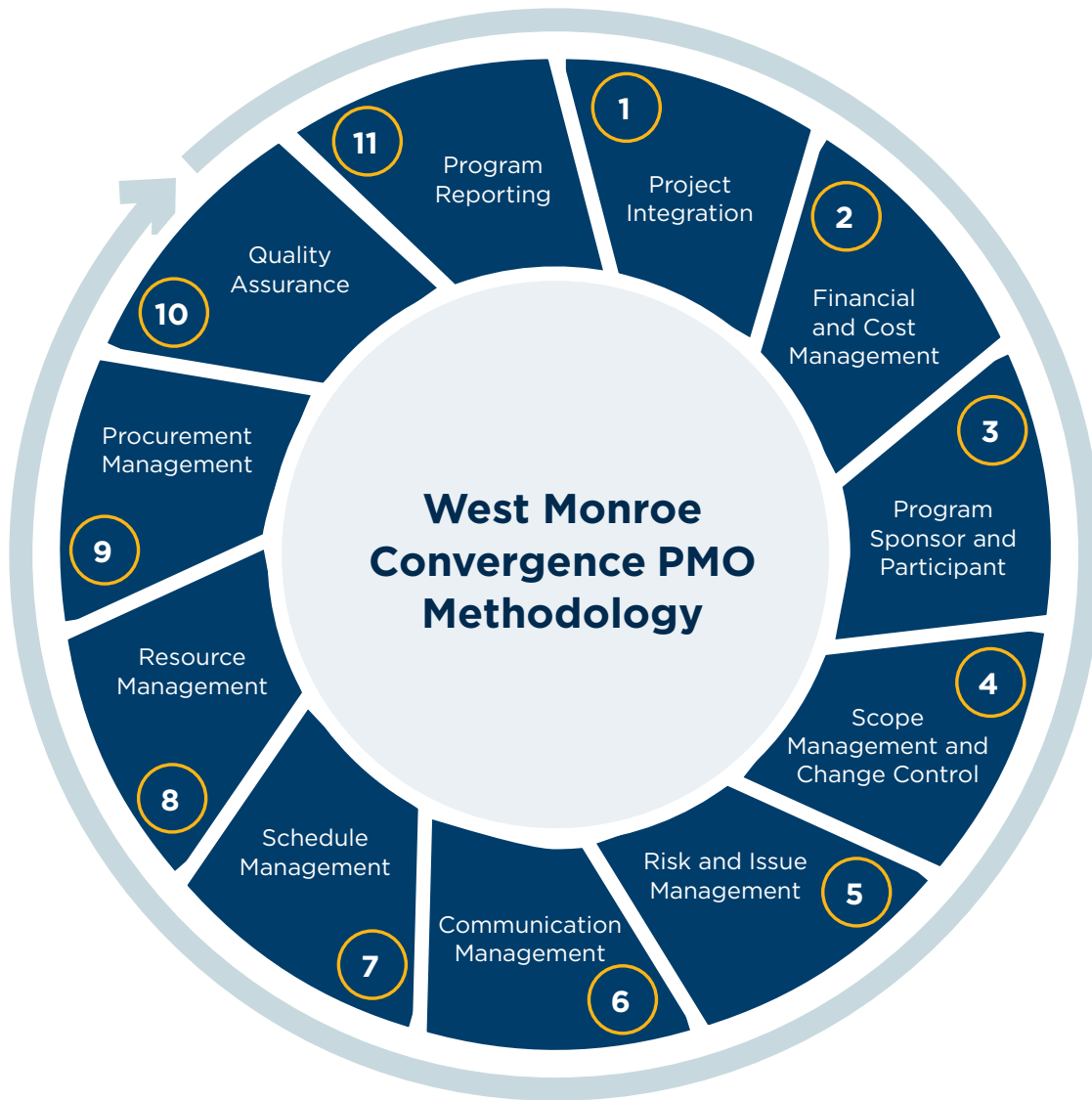


Figure 8

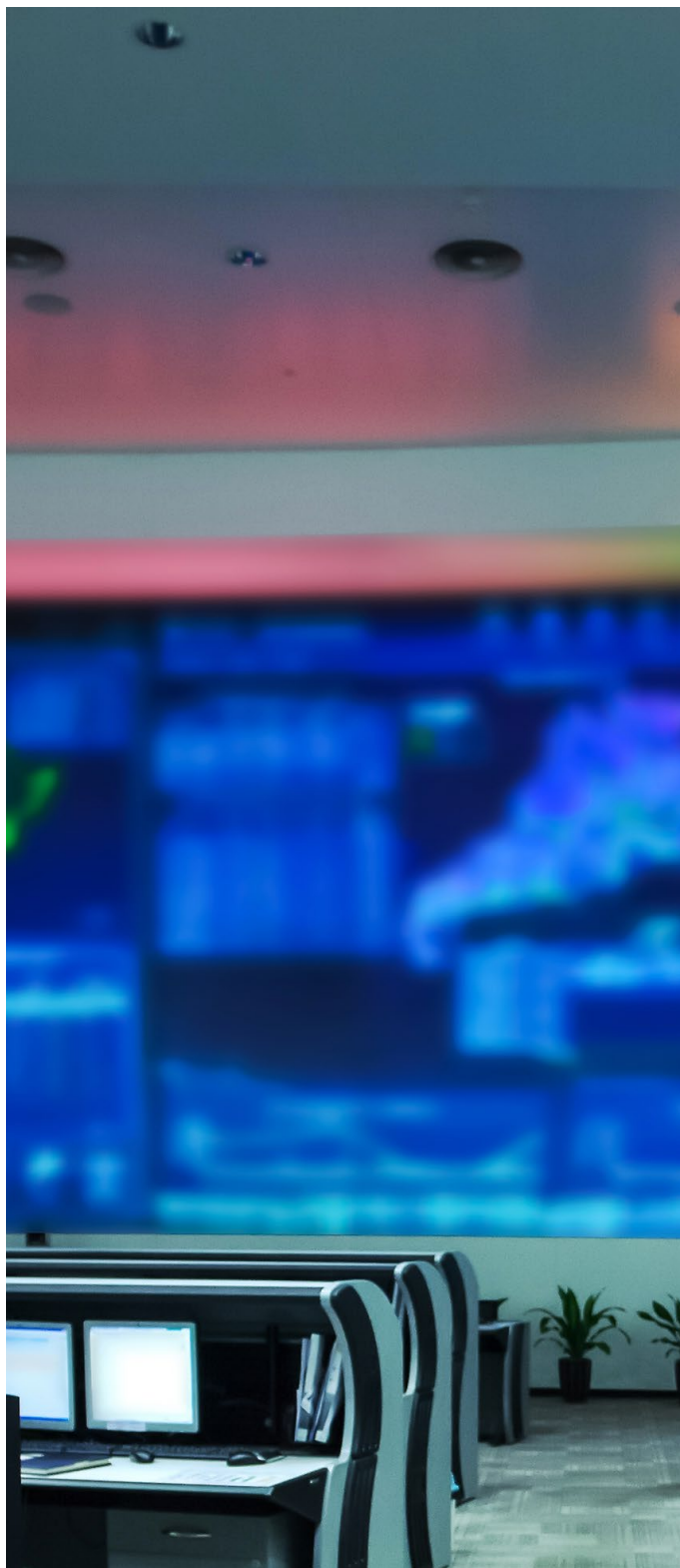
## FOUNDATION

- **Governance:** Setting up the right governance model from the start and having a PMO that is willing to lead is critical to sustaining long-term change and process efficiency
- **Charter:** Engaging program stakeholders in charter development to drive collaboration across teams and vendors
- **Document management:** Developing and maintaining key process documentations, tracking risks, actions, issues, and decisions (RAID), developing program status reporting

## PMO CONVERGENCE AND CORE SERVICE REQUIREMENTS

1. **Project integration:** Creating an engaged culture of curiosity and learning and leveraging a centralized tool and/or structure for the management of program processes and key program documents in a controlled fashion to drive collaboration and consistency
2. **Financial and cost management:** Developing transparent and timely reporting of financials and detailed, proactive managing of budget through comprehensive reporting tools to identify discrepancies and drive informed decision-making
3. **Sponsor and participant engagement:** Creating clean communication channels and actively maintaining the sponsor and participant registers to promote engagement across the ADMS program and streamline communications
4. **Scope management and change control:** Understanding project boundaries and ensuring scope and convergence management as efforts across workstreams, resources, and results can be impacted by a single change in scope
5. **Risk and issue management:** Proactively resolving threats to success and applying thorough analysis and proactive management to the timely identification and flexible mitigation of risks, issues, and other impactful events; offer a proven tool and approach to prioritize and handle risks
6. **Communication management:** Driving efficient and value-adding sponsorship and leveraging communication channels to empower stakeholders to establish the vision and effectively advocate for the required resources, decisions, and execution support; establish informal change networks to facilitate communication
7. **Time and schedule management:** Scheduling the right work at the right time in the right sequence; refining and managing a detailed Consolidated Master Project Plan (CMPP) that sets the standards for project execution including processes and tools required to “operationalize” the project and monitor work content, integration, and progress

8. **Resource management:** Aligning responsibilities and expectations and allocating work consistently, fairly, and transparently to all team members via an integrated resource plan—with a specific focus on a culture of accountability and shared purpose
9. **Procurement management:** Creating centralized program-level contracts tracker and monitoring and utilizing program-level tracker for all vendor contracts in all workstreams to ensure holistic control over all contract changes within the ADMS program
10. **Quality assurance, management, and control:** Verifying and working across workstreams and vendors to ensure a defined and executed comprehensive quality management process
11. **Program reporting:** Actively and directly engaging with key team leads, vendors, and leadership to understand and challenge work plans, activities, and issues
12. **Program cost monitoring:** Define variance thresholds (SPI/CPI) or establish earned value management (EVM) process to track, forecast, and control factors that may cause overages or overruns in the future



## ◆ CHAPTER 8

# Managing transformational change during project execution

## OBJECTIVE

*Be thoughtful and thorough in planning for hands-on change management.*

**B**e ready for a complete overhaul of people, process, and technology:

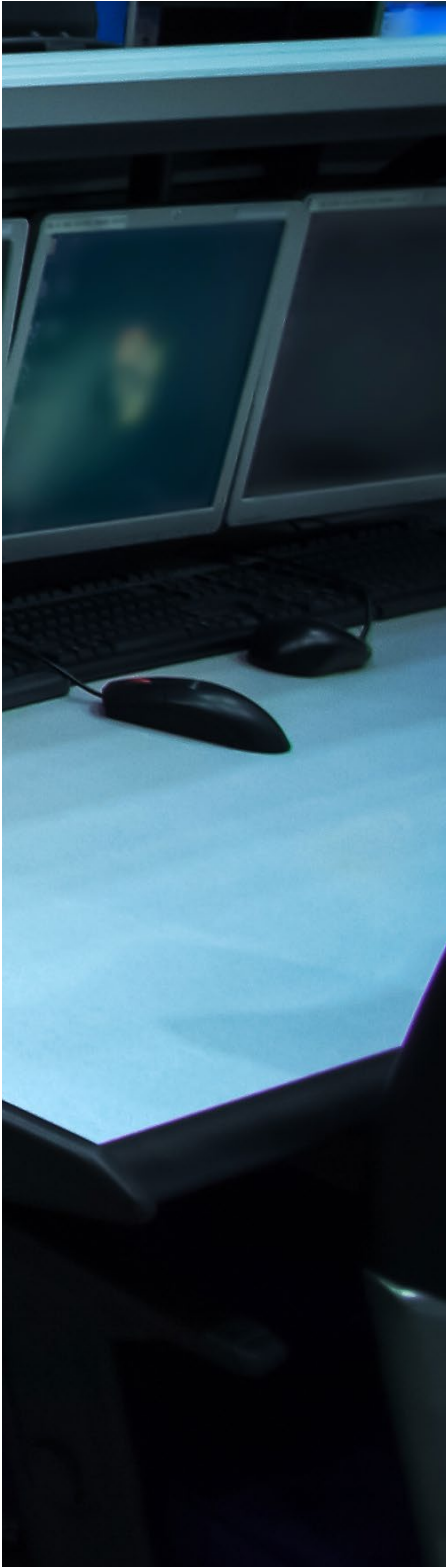
- **People:** ADMS will significantly change how people perform their daily work. They will need to be upskilled, trained, and reorganized to manage the new systems, and executives will need to continuously align throughout the project’s lifecycle

- **Process:** All stakeholders will experience new processes and procedures as a result of ADMS. These operational changes will need to be defined and assigned for new and evolving role responsibilities
- **Technology:** ADMS not only changes the way utilities deliver electricity but also creates interdependencies with other technical systems that will ripple throughout the organization

If these change impacts are not properly managed, users will not understand who, how, or when to use these new systems. Additionally, it will be difficult for any utility to achieve its desired state of modernizing and improving its distribution grid system without the right change mindset.



Figure 9



## TEAM MANAGEMENT GOALS

- Establish a solid foundation of employee training from the start to effectively engage and educate stakeholders throughout the lifecycle of the project
- Solidify a common understanding of specific workstreams and roles so that even as program resources shift, everyone is moving in the same direction
- Move beyond the “control room” as the sole focus of efforts to manage operators and consider all departments that experience interdependencies

## HOW TO GET GOING IN THE RIGHT DIRECTION

- Align objectives with leaders by program and audiences/workforces
- Define necessary workforce capabilities and future state of talent
- Match workforce capacity to demand
- Prioritize regular communication and project updates
- Schedule a defined cadence of meetings and/or announcements with standardized templates
- Escalate important decisions required of governance/leadership team, who then communicate to teams in a timely manner to respective groups/stakeholders
- Provide a forum for stakeholders to voice their points of view and provide input
- Make sure software gets to operators early for their buy-in
- Plan for scenario-based training, “demo rooms,” and table-top exercises

## ◆ CHAPTER 9

# Quality assurance and deployment readiness

## OBJECTIVE

*Define success through quality assurance and testing system readiness are critical components of successful ADMS deployment.*

The goals of a quality assurance plan are to define what “good” looks like for the program, identify and track key metrics, and establish quality controls to verify that new processes and procedures are followed. Through the lifecycle of the project, periodic deployment readiness tests will signal whether tracked metrics indicate readiness for new phases or milestones.

RISK AREA	THEME	PROJECT NEEDS	COVERAGE ROLES
Solution definition and requirements change/ evolve over time	Solution Completeness & Readiness	Centralized metrics and reporting of solution completeness, validated through testing	Solution Completeness Reporting, Detailed Design QA Reviews
Lack of program deployment readiness indicators		Alignment and assessment of business and technical readiness, (e.g. testing metrics), legacy system retirement criteria	Deployment Readiness, Independent Validation and Verification (IVV)
Solution not delivering on business outcomes or user expectations		Business outcome success criteria, operator use case definition and success criteria, post-production validation	Operator Use Case and Business Outcome Validation, Operational Reporting
Shifting team focus and priorities during phase & milestone transitions	Audit Readiness	Planned qa assessments prior to key transition periods to evaluate risks, processes and tools	QA Health Assessments / Audit Readiness Function
Project external risks	External Dependencies Mitigation	Proactive and reactive identification & addressing of impacts to program	External Risk Management
Deployment window and dependencies	Deployment Coordination	Clear roles and responsibilities, black out windows, dress rehearsals for deployment	Deployment Coordination
Environment management & integration preparation		Environment management plan/strategy & integration validation activities	Environments Management

**Figure 10**

## Deployment Readiness

As utilities work towards deployment, a readiness framework and reporting is critical in order to inform stakeholders and leadership on risks and evolving challenges as go-live approaches. Building a consolidated view of readiness across applications, technical architecture, solution, business, and deployment using key metrics help focus program teams on critical areas and potential gaps. Paired with mock cut-overs and other activities, diligently assessing readiness for deployment helps utilities avoid last minute surprises and allows for reducing cost and performance impacts associated with poorly executed go-lives.

Readiness Area	1) Application Readiness	2) Technical Architecture Readiness	3) Solution Readiness	4) Business Readiness	5) Deployment Readiness	6) External Readiness
A	Tech Infrastructure and Build Interface	Environment Configuration and Patching	Pre-FAT and Perf. Test Prep	Overall Training Solution	SCADA DB Verification	Cross-Release Dependencies
B	SCADA System Development	Environment Stability	SAT/SIT Testing	Training	GIS Data Enhancements	Other Cross-Impacts
C	SCADA Integration Development	Batch Architecture	UAT Testing	Program Management and Communications	Scope Stability	Vendor Critical Path
D	Network Model Build - Subs and Feeders	Cybersecurity Readiness	Performance Testing	Documentation	Workstation Deployment	Weather and Storm Flag
E	Network Model Build - SCADA DB		ORT/Report Testing	Business Preparation	Cutover (Field Communications)	Audit Compliance
F	External Integrated System Development		Penetration Testing	Business Process Design	Cutover Strategy and Plan	DSCADA Maintenance
G	User Access		Operational Metrics	Business Escalation Process	Post-Go-Live Support	
H			Open Defects	Executive Support	Conversion Strategy	
I			Workarounds		Go-Live Tickets	
J			P2P			

Input	Definition
Dark Blue	Completed / All required actions completed
Green	On track / Ready for go-live with minimal workarounds
Yellow	At risk / Watch area for completion prior to go-live
Red	Off track / Not ready for go-live

Figure 11

## QUALITY & CONTINUOUS IMPROVEMENT

Continuous improvement aligns with quality management. During implementation you should have addressed methodology to track and share learnings, maintenance and review of quality practices, and make adjustments to quality management plans based on performance results. Simple efforts such as clear documentation approval processes can make a large impact on program quality with limited additional investments.

### QUALITY ASSURANCE GOALS

- Develop a comprehensive quality assurance approach including:
  - Quality management plan
  - Quality standards
  - Testing and defect management plan
- Leverage a third-party perspective—whether internal or a partner—to oversee the quality of the program
- Maintain traceability of requirements, designs, and test cases
- Observe and track solution completeness
- Think through deployment considerations, go/no-go criteria, readiness metrics, mock cutovers, and potential operational concerns that may impact go-live dates

- Determine your testing validation plan and process including Pre-FAT, FAT, SIT, SAT, UAT and performance testing
- Engage firms like West Monroe with experience working with several utilities in developing “Blue-Sky” and “Storm” load/stress/performance test scenarios and cases to ensure the end product meets or exceeds expected performance criteria and industry benchmarks

### QUESTIONS TO CONSIDER TO TEST PROGRAM READINESS

- What does success look like and how will quality be measured?
- How is solution completeness defined and measured throughout the program?
- What go/no-go criteria is in place? What operational factors may impact go-live?
- Are users ready to accept the solution? Do you have clear visibility into user readiness?
- What potential risks exist to user adoption and benefits realization and how are you mitigating these risks?

◆ PART 4

# What comes next



## ◆ CHAPTER 10

# Assessing post-release quality and performance

## OBJECTIVE

A multitude of unforeseen complications may occur during ADMS projects that may result in “missing the mark” or unrealized business outcomes. West Monroe works with our clients to help “right the ship” and help diagnose and resolve system issues after “go live”. Some pain points commonly experienced post-release include:









POST-RELEASE PAIN POINTS	POST PROGRAM ASSESSMENT FOCUS
 <b>Gaps are identified in how the ADMS solution operates post go-live by users</b>	Collection of functionality and user pain points and assessment of potential resolutions, facilitated discussions with product vendor
 <b>Pain points between systems (both inbound and outbound) such as ETR updates, tickets, AMI data</b>	Architecture review and integration deep dives to identify root cause and potential remediations
 <b>SCADA control and telemetry issues</b>	Review and identification of targeted P2P plans to fix issues from conversions
 <b>Low user adoption, increase in operating errors, poor employee morale</b>	Stakeholder/user interviews, development of change management strategy to remediate problems, inspire change champions to lead ADMS adoption
 <b>System failures during peak storm activities</b>	Identification of peak scaling requirements, stress testing tools, and steps to improve system reliability/resiliency
 <b>Lack of accuracy of customer connectivity, power flow or state estimation</b>	Identify root cause of issues between data quality, process and identify remediations, demonstrate ADMS effectiveness based on high quality data
 <b>Inability to leverage advanced applications effectively</b>	Identification of root causes and suggested actions to improve (data cleanup, training, implementation of metrics)
 <b>Inability to capture and communicate investment benefits to regulators or business stakeholders</b>	Development of baselines and benefit realization strategy to capture benefits for regulator

Figure 12

Performing a post-release quality assessment is a way to align stakeholders on successes and areas for improvement and rally the team to move forward on addressing potential “misses” during deployment and rally the team on what needs to happen to realize the benefits expected.

## POST-RELEASE QUALITY ASSESSMENT GOALS

- Be deliberate about how your system will expand over time in order to realize the full value of your initial investment
- Assess the system as a whole; issues may not specifically be a platform issue, but an issue across multiple systems
- Keep interdependencies top-of-mind (e.g., adding DER capability will require system integration and close interactions with ADMS)
- Don't forget the personal side; assess user adoption and potential training or job skill gaps that are keeping the platform from being successfully operated

## “RIGHTING THE SHIP” CONSIDERATIONS

- Carefully manage outstanding defects and drive vendor support of solving issues
- Break down silos between teams and aim for the “right” solution, don't complete band-aid fixes, and shy away from fixing root causes due to internal politics
- It's not about blame but rather ensuring that the investments made deliver the business value expected
- An independent third party can provide clear insights unaffected by historical decision making or ulterior motives

## ◆ CHAPTER 11

# Expanding ADMS capabilities and operational maturity

## OBJECTIVE

*Anticipate the ongoing and evolving nature of ADMS deployment and deliberately build out operational maturity through new functionality.*

We've partnered with utilities across the country over the last decade on projects of grid modernization and ADMS deployment. Rarely does an initial deployment include the full suite of functionality a utility will ultimately need. As a result, the system and procedures you put in place for an initial deployment must be flexible and repeatable in case you need them again in the future.

Each new enabled capability should be viewed as its own project or release—with its own business case, change management support plan, testing protocol, and communication strategy to ensure end-user adoption. Without investing the attention, utilities risk poor adoption and lack of value from tool investments.

As utilities work to improve their operational maturity through grid modernization and other investments, it's important to have an overall strategy and understanding of the capability roadmap for their ADMS program. A value-driven roadmap allows for continued expansion of business benefits and enablement of new capabilities where they make the most business sense. You may be dependent on external projects (data cleanup on GIS, for example) to operationalize new functionality, so keep close tabs on these interdependent projects.

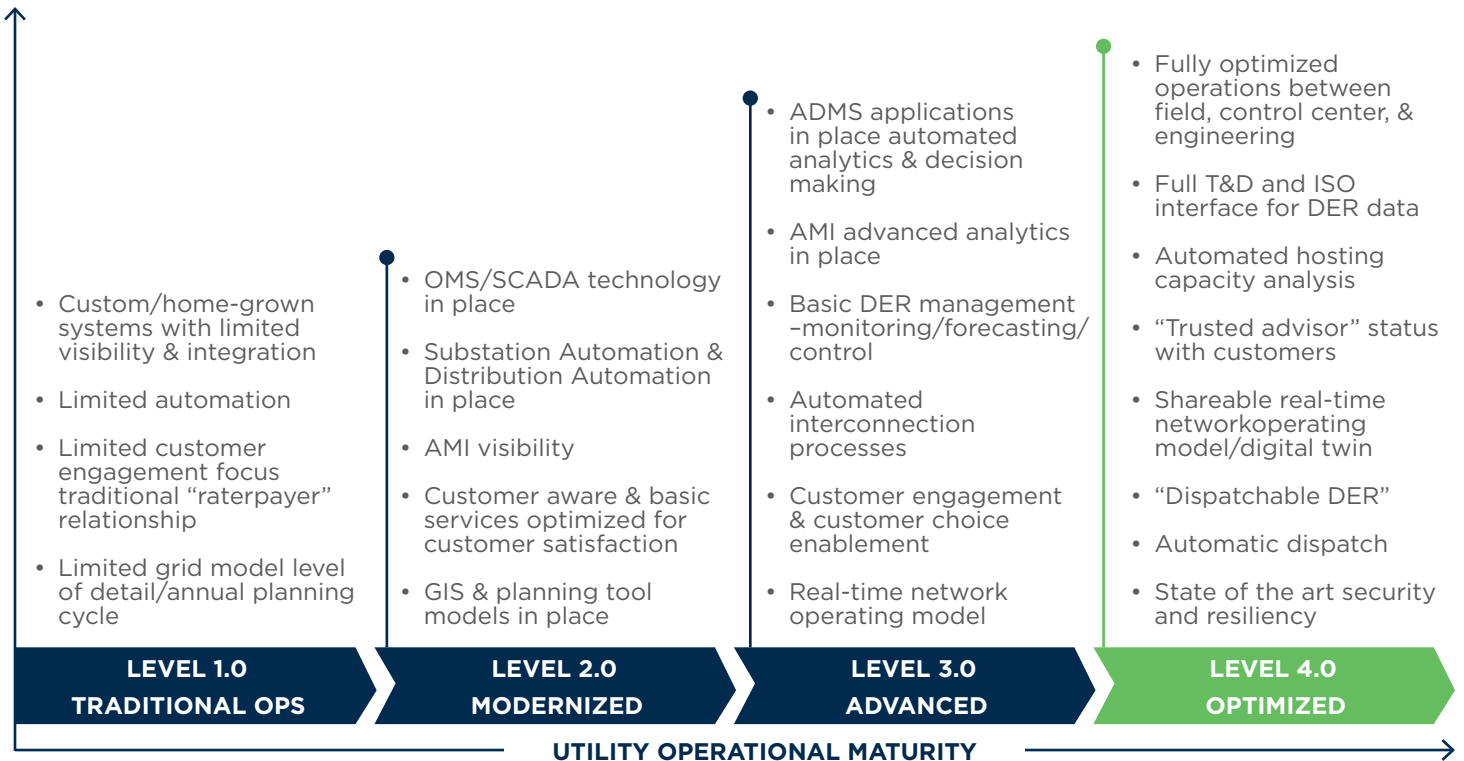


Figure 13



## FURTHER DEPLOYMENT PLANNING GOALS

- Be deliberate about how your system will expand over time in order to realize the full value of your initial investment
- Keep interdependencies top-of-mind (e.g., adding DER capability will require system integration and close interactions with ADMS)

## FUNCTIONS THAT MAY CALL FOR CONTINUING EXPANSION

- Installations and upgrades to field devices for DA applications such as VVO and FLISR. The controls for older field devices such as capacitor banks, voltage regulators, and reclosers may need to be retrofitted or fully replaced
- Feeder studies and upgrades are likely required for optimal performance
- The telecommunication infrastructure outside the substation needs to be able to handle advanced network requirements

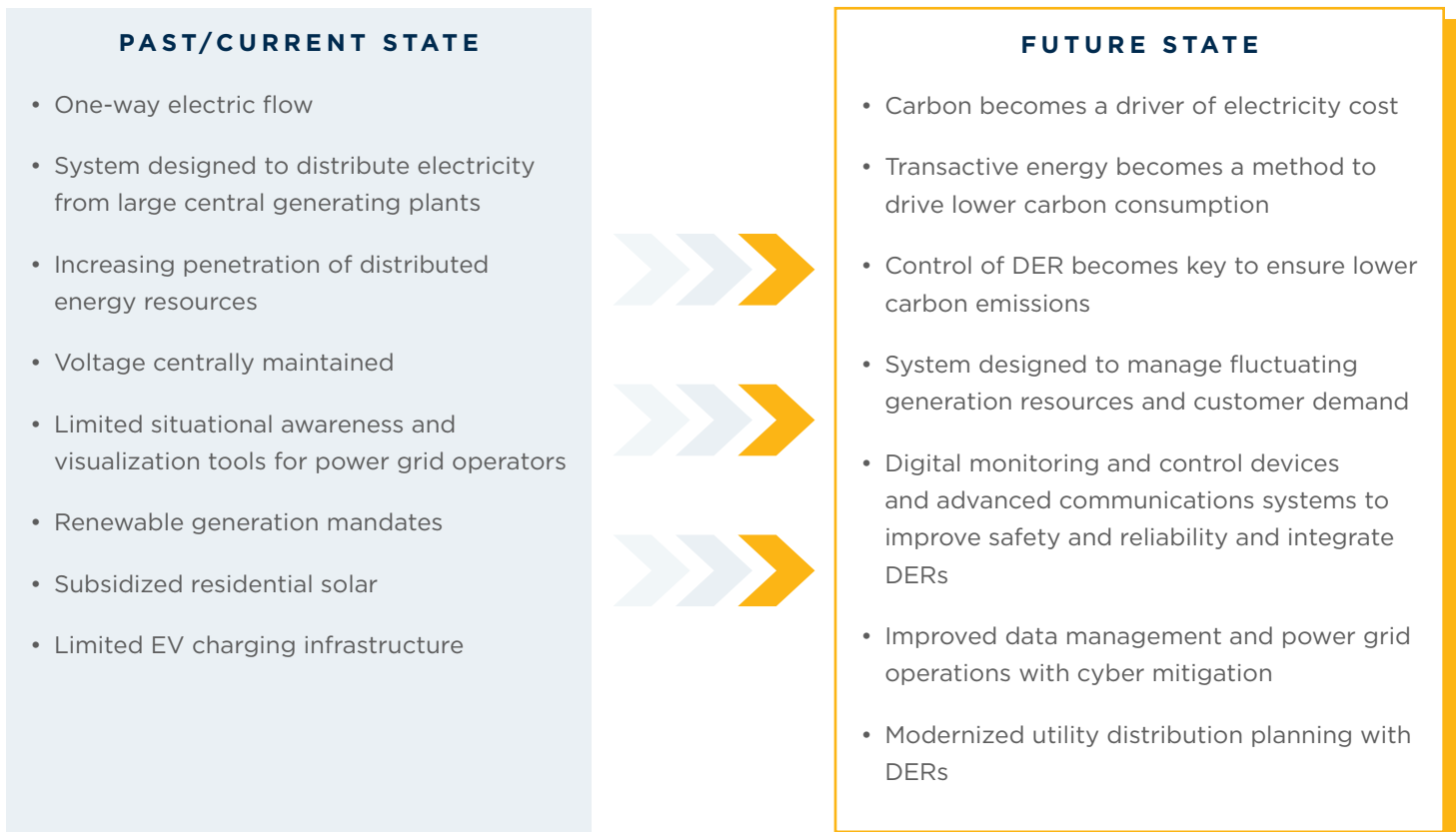
## ◆ CHAPTER 12

# Mapping ADMS investments to the “grid of the future”

## OBJECTIVE

*Stay two steps ahead of the market and operational needs.*

**A**s the energy industry transforms in the coming years, many major changes are going to either align with your ADMS design or create new challenges.



**Figure 14**

The dynamic and evolving nature of grid transformation and decarbonization means ADMS programs must also be constantly changing. Further, investments should not stop the day after the program goes live. Utilities must continue to monitor the changing conditions and think strategically how ADMS can continue to provide benefits into the future. Long-term roadmaps should plan for increased EVs and DER and identify where ADMS capabilities can enable business benefits.

The development of key use cases over short/medium/long term (example shown below) tied to forecasted grid changes can be used to educate internal and external stakeholders on the requirements and expected functionality needs, securing additional funding, and driving vendor roadmaps in alignment with true operational needs.

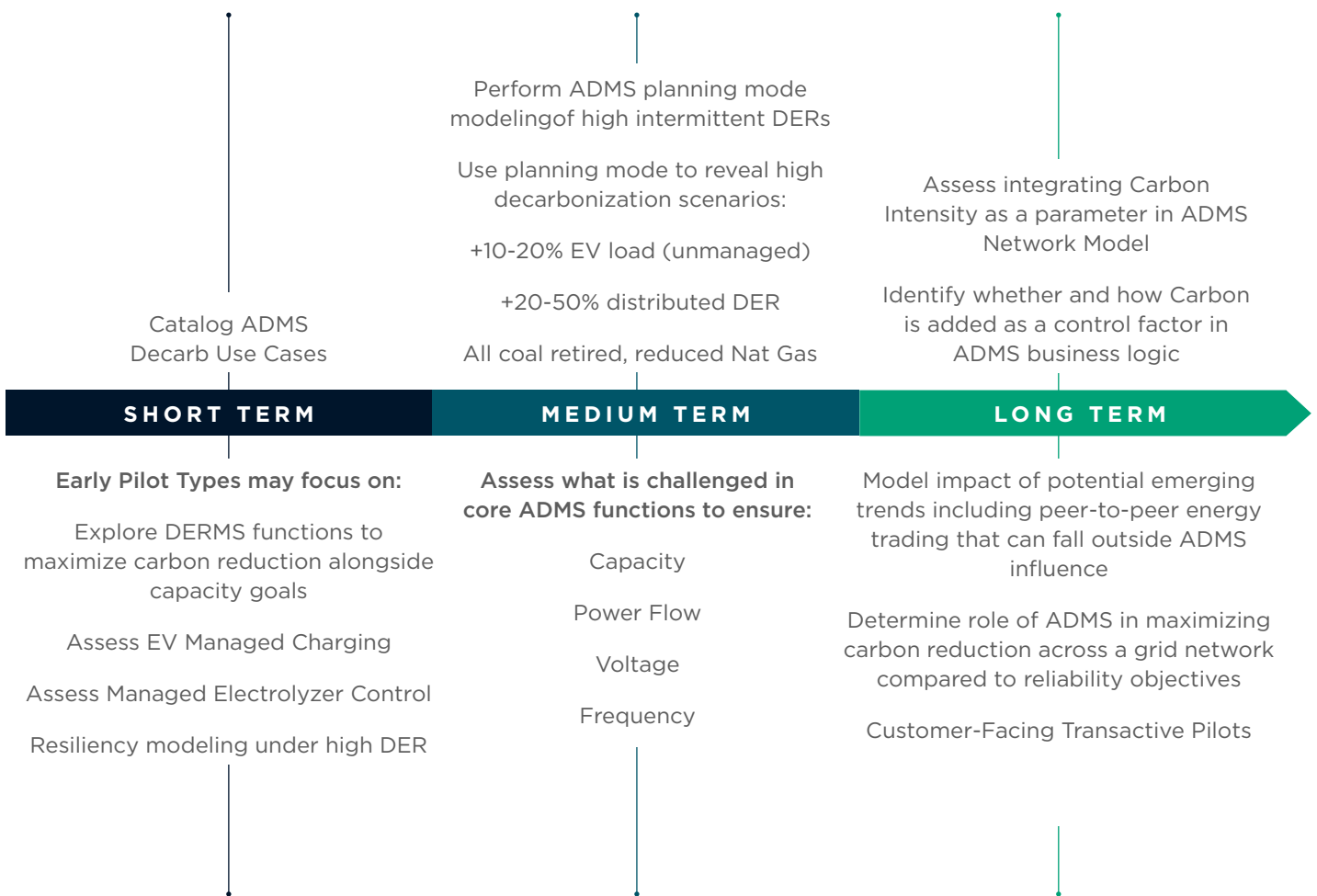


Figure 15

## CONTINUAL ADMS IMPROVEMENT GOALS

- Develop a long-term roadmap and continue to revisit assumptions and needs year-over-year, identifying external change vectors and evolve platform needs and conditions shift

## KEEP YOUR KEY STAKEHOLDERS IN THE LOOP OF YOUR BUSINESS NEEDS

- Be proactive about engaging with your chosen vendor and other utilities using the same platform to influence roadmap decisions and platform direction
- Stay aligned between policy teams, IT, and operations to ensure process and technology investments can deliver on regulatory commitments
- Educate your customers on the value of the investments made in ADMS and how these new tools allow for your utility to continue to deliver high satisfaction as the grid evolves



# HOW WEST MONROE CAN HELP

West Monroe provides its clients with support across the full lifecycle of DSCADA/ADMS programs, from initial strategy to benefits realization. Our experienced team leverages cross-functional expertise and business focus to set our clients up for success, and lean-in during implementation to deploy solutions that deliver on business value.

## OUR ADMS OFFERINGS

### PLANNING




Strategy &  
Business  
Case



Architecture &  
Requirements



Business  
Integration



Vendor  
Selection &  
Contracting  
Support


### IMPLEMENTATION




Program  
Leadership/  
PMO



Quality  
Assurance/  
Oversight



Change  
Management/  
CMO



Interdependency  
Management

# GLOSSARY OF TERMS

<b>ADMS</b>	Advanced Distribution Management System
<b>AIM</b>	ADMS Interdependency Framework
<b>AMI</b>	Advanced Metering Infrastructure
<b>BI</b>	Business Integrator
<b>CIS</b>	Customer Information System
<b>CMPP</b>	Customer Information Systems
<b>CVR</b>	Conservation Voltage Reduction
<b>DA</b>	Distribution Automation
<b>DER</b>	Distributed Energy Resources
<b>DERMS</b>	Distributed Energy Resource Management System
<b>EAM</b>	Enterprise Asset Management
<b>EMS</b>	Energy Management System
<b>EVM</b>	Earned Value Management
<b>FAN</b>	Field Area Network
<b>FAT</b>	Factory Acceptance Test
<b>FLISR</b>	Fault Location Isolation and System Restoration
<b>GIS</b>	Geographic Information System
<b>ISO</b>	Independent System Operator
<b>IVR</b>	Interactive Voice Response
<b>MWFM</b>	Mobile Work Force Management System
<b>NERC/CIP</b>	North American Electric Reliability Corporation / Critical Infrastructure Protection
<b>O&amp;M</b>	Operation and Maintenance
<b>OMS</b>	Outage Management System
<b>PMO</b>	Program Management Office
<b>RFP</b>	Request for Proposal
<b>SA</b>	System Architecture
<b>SAT</b>	Site Acceptance Test
<b>SCADA</b>	Supervisory Control and Data Acquisition
<b>SI</b>	Systems Integration
<b>SIT</b>	Systems Integration Test
<b>SOA</b>	Service-Oriented Architecture
<b>SPI/CPI</b>	Schedule Performance Index and Cost Performance Index
<b>UAT</b>	User Acceptance Testing
<b>VVO</b>	Volt VAR Optimization

## ABOUT WEST MONROE

West Monroe is a national consulting firm that was born in technology but built for business—partnering with companies in transformative industries to deliver real, measurable results. Technology is who we are, it is not something we bolted on overnight, and we believe it is one of the greatest enablers of business value. That’s why we work in diverse, multidisciplinary teams that blend industry expertise with deep operational and technology capabilities to create quantifiable, financial value for our clients. Our 1,500 employees based in seven offices across the United States also own 100% of our business, so when you partner with us you know we are committed—because your success is our success. Our undeniably different approach breeds undeniable results. **Visit [westmonroe.com](https://westmonroe.com) to learn more.**

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