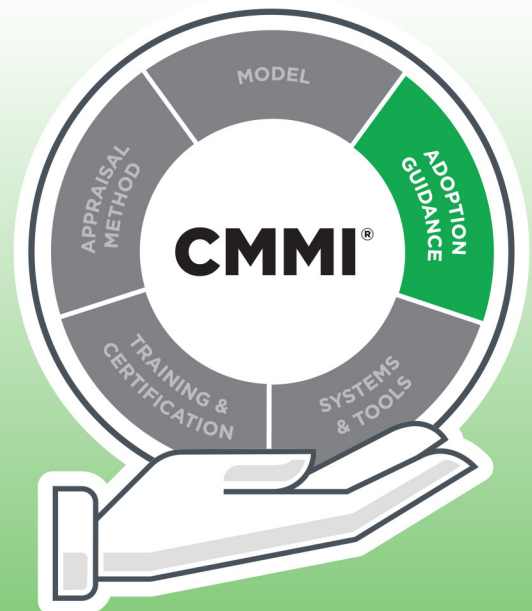




CMMI Adoption Guidance



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Document Change History

Version	Date	Description
4.0	07 July 2026	Updates include: • Minor updates for general grammar/formatting and consistency with the CMMI Performance Solutions ecosystem, e.g., graphics, copyright including updates from ISACA to CMMI Institute • Updated content throughout to contain CMMI Artificial Intelligence Maturity (AIM) related information to align with the CMMI AIM Model (V4.0) release • Updated Figure 18. Performance Report Measurement Categories and Related Subcategories to align with updates to MDD Toolkit-Performance Report Template (V4.0) release • Added additional resources to Figure 13: CMMI Adoption Resources • Added AI-related business examples to Figure 15: Problem Identification and Resolution Using CMMI • Updated Appendix I: Figure 19: CMMI Context Specific Tags to include all context specific tags that align with CMMI AIM Model (V4.0) release • Added new Appendix J: CMMI Crosswalks to provide insight into CMMI Crosswalks • Updated content throughout to contain references to CMMI Crosswalks and CMMI Crosswalk – AI Bundle release including link to CMMI Crosswalk information page on the CMMI Website • Created release notes file and consolidated prior changes made since the previous release into the file
3.1.01	31 October 2024	Updates include: • Minor updates for general grammar/formatting and consistency with the CMMI Performance Solutions ecosystem, e.g., graphics, copyright • Updated Figure 18 Measurement Categories and Related Subcategories to align with updates to the Performance Report Template

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Introduction to this Guidance

Intended Audience

The audience for this guidance includes anyone who is:

- Facing business challenges and wants to address them by using the Capability Maturity Model Integration® (CMMI®)
- Looking to adopt multiple standards, including CMMI, as the integrated starting focal point
- Trying to improve the performance of their business systematically, efficiently, and effectively
- Building responsible and ethical Artificial Intelligence (AI) capabilities within their organization

What is Capability Maturity Model Integration (CMMI)?

CMMI is a performance improvement model for organizations and projects that want to achieve increasingly better performance and solve business challenges. Proven effective globally in business and government for over 25 years, CMMI is an integrated framework of best practices that can rapidly improve and sustain any organization's performance to elevate quality, profitability, productivity, cybersecurity resilience, and competitiveness.

CMMI is not prescriptive; rather it describes what to do to improve an organization's capabilities, not how to do it. This makes the model very flexible to meet the unique needs of any business. In addition, CMMI complements and enhances performance improvement in conjunction with other industry models and standards. CMMI Crosswalks provide a direct mapping between the CMMI Model and a relevant industry standard. Use CMMI to establish processes that help an organization or project meet Business Objectives and improve performance in ways that matter most.

CMMI includes multiple domains and views. The organization can select the Capability Areas, Practice Areas, domains, or views that are most pertinent to their business operations. For example, for organizations required to follow security regulations, they may select the Security domain, or the Capability Area of Managing Security and Safety. Organizations looking to adopt AI in a structured, responsible, methodical manner may select the Artificial Intelligence Maturity (AIM™) view. To achieve the most impactful and productive results, it is important to incorporate a domain, like Security, into a performance improvement initiative. This involves full integration with the organization's activities, e.g., embedded within program plans and process assets, and the incorporation should not be treated as an afterthought, e.g., adding an item to

Capability: Anything an organization must do well that drives meaningful business results. Capabilities are what an organization needs to implement its business model or fulfill its mission and achieve measurable business results. All organizations have capabilities, without them a business could not start or grow. Capabilities are typically organizational level skills, abilities, and knowledge embedded in people, processes, infrastructure, and technology.

a checklist, adding a security representative into a meeting. CMMI deliberately integrates each domain, like Security, into all aspects of the CMMI Categories of “Doing,” “Managing,” “Enabling,” and “Improving” processes. Refer to [Figure 3. Categories and Capability Areas](#).

Why Use CMMI?

CMMI helps businesses to quickly understand their current level of capability and performance both in the context of their own objectives and as compared with other businesses and organizations. If business needs and objectives are not being met, CMMI practices can guide systematic and effective improvement to elevate and optimize performance to better serve the needs of the business and ultimately the customer. The CMMI Model is a collection of industry best practices that can be used to aid in adoption of several standards with one common framework.

The need for improvement can originate from internal and external sources. Customers may demand improvements. Market forces may drive the need to improve competitiveness. Government or industry regulations may require changes in how an organization operates. Rather than using multiple approaches for achieving similar performance, contractual, or regulatory compliance goals, CMMI provides a single approach, or framework, for an organization to address these multiple needs. For example, new security threats and vulnerabilities are continually surfacing within industry, and in response to the increased challenges the United States Department of Defense developed the Cybersecurity Maturity Model Certification (CMMC). CMMI provides a solid foundation for the CMMC maturity processes required. For instance, the CMMC model is relatively silent on process design, development, persistence, habit, and performance, whereas CMMI provides proven holistic approaches for each of these by providing integrated best practices for policies, processes, procedures, and planning which are the foundational elements in CMMI for persistence and habit. AI is transforming the business landscape but this quickly evolving technology raises risks and concerns. Adopting CMMI AI in a responsible, strategic, holistic manner with accountability and governance can position an organization to do so in a safe, secure, and effective manner increasing capability. The CMMI AIM view provides insight into how to integrate AI best practices within organizational processes.

Using CMMI provides many benefits including:

- Providing a positive return on performance improvement investments
- Meeting commitments that result in:
 - More timely delivery
 - Fewer last-minute crunches
 - Enhanced cost control
 - Increased quality of solutions
- Increasing management visibility which results in:
 - More rapid response to issues and risks
 - Fewer surprises
 - Met or exceeded customer needs and expectations
 - Reduced defects and customer complaints

- Reduced rework
- Lower employee turnover
- Increasing organizational scalability, agility, and responsiveness
 - Holistic view across multiple capabilities
 - Performance and outcome-based approach to processes
 - Flexibility to adapt processes to evolving requirements and issues such as cybersecurity
 - Project and organizational tailoring of processes to meet unique customer needs
 - Ability to adopt multiple standards, frameworks, or assist in compliance with regulatory requirements

A [CMMI Performance Report Summary](#) has been published showing tangible performance benefits and improvements from organizations' adoption of CMMI. Additional benefits can be found in [Appendix D: Typical CMMI Adoption Roles](#). This appendix describes different roles involved in adopting CMMI, the activities performed by those roles, and the associated benefits from using the model. [CMMI Crosswalks](#) provide mapping from CMMI to relevant industry standards to help minimize process overhead through one unified approach. Refer to [Appendix J: CMMI Crosswalks](#) for additional key features and benefits.

Why Use this Guidance?

This adoption guidance helps any organization use CMMI as a roadmap for its performance improvement journey. An organization can benefit the most from CMMI by tailoring its practices in a way that best fit its business environment. This guidance places an organization on the right track to effectively apply CMMI practices to your organizational and project processes and integrates with other standards. See [Figure 1. Adoption Guidance Overview](#).

Figure 1. Adoption Guidance Overview

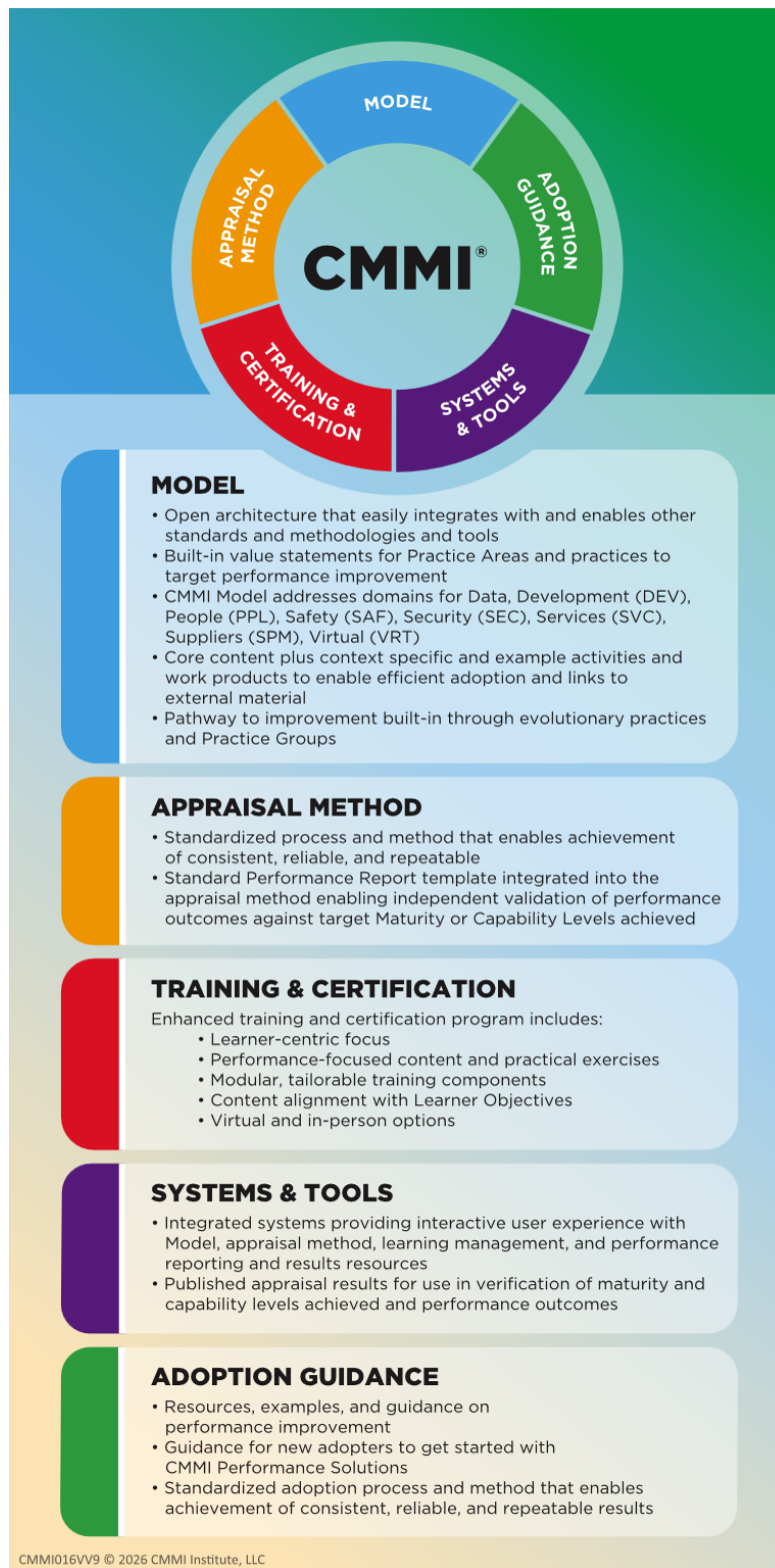
This Guidance Is...	This Guidance Is NOT...
An overview of activities and considerations when using CMMI to enable performance and process improvement	A detailed checklist or "how to" guide or a set of executable processes
Built on lessons learned and best practices derived from a broad variety of industry experiences	A set of activities and considerations for appraisal preparation
A reference to assist CMMI adoption	The only approach for adopting CMMI

How to use this Guidance

This guidance describes high-level steps for adopting CMMI in an organization. Each step includes a brief description, activities to perform when implementing the step, and suggestions to consider when performing the activities. The step may include additional information such as examples, elaborations, training, tools, and techniques. This guidance is designed and intended to continually improve and be kept current with the latest techniques, content, technologies, and other trends with practical input from CMMI Partners and users.

Definitions and Tips: Throughout this guidance, these blue boxes will include definitions of CMMI terms, tips, hints, and other best practices to consider when adopting CMMI.

[Figure 2. CMMI Performance Solutions Ecosystem](#) shows the parts of the CMMI Performance Solutions ecosystem. This guidance information is just one resource in the integrated CMMI Performance Solutions ecosystem and aids organizations with the successful adoption of CMMI. This guidance serves as a navigator to assist users to understand how all the ecosystem resources fit together and to efficiently utilize these resources to support their Business Objectives.

Figure 2. CMMI Performance Solutions Ecosystem

In addition to these ecosystem components, CMMI Institute provides several resources for adoption. For a detailed list of adoption resources, refer to [Appendix A: Additional Resources](#).

The adoption guidance follows the primary CMMI categories “Doing,” “Managing,” “Enabling,” and “Improving” as part of its six-step approach. [Figure 3. Categories and Capability Areas](#) lists the CMMI categories and their Capability Areas.

Figure 3. Categories and Capability Areas



For a list of Categories, Capabilities, and Practice Areas, refer to [Appendix B: CMMI Categories, Capability Areas, and Practice Areas](#) in this document, and refer to the following sections in *CMMI Model, Part One: About CMMI and Executive Summary* and *Appendix A: Predefined Model Views – Categories and Capability Areas*.

Each step in this adoption guidance lists the Category that corresponds to and supports that step. Refer to [Figure 4. Steps for Applying CMMI for Continuous Improvement](#).

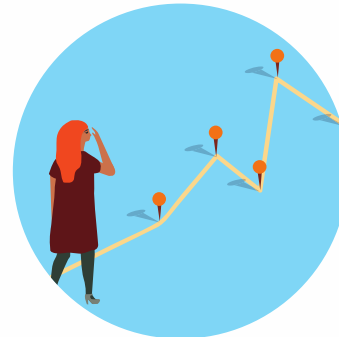
Figure 4. Steps for Applying CMMI for Continuous Improvement



01 LEARN
Learn how CMMI will benefit the organization



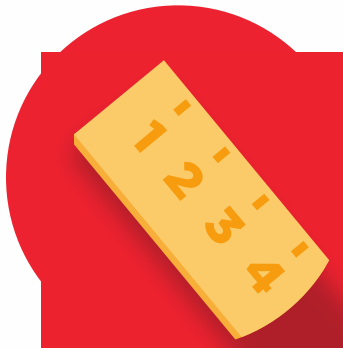
02 ESTABLISH OBJECTIVES
Develop and communicate business performance and improvement objectives



03 ANALYZE
Map current organizational processes to the CMMI



04 DEVELOP ACTION PLAN
Develop, keep updated and follow an improvement plan to get from the current state to the desired state



05 DEPLOY IMPROVEMENTS
Deploy and follow updated organizational processes, and measure performance



06 ASSESS CAPABILITY
Assess organizational capabilities

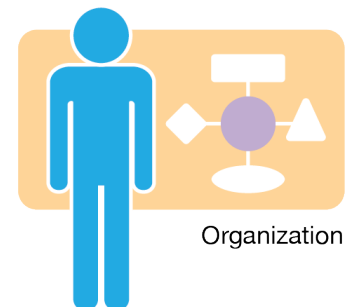


LEARN

Step 1: Learn how CMMI will benefit the organization

In this step, the organization:

- Gets to know CMMI
- Learns how CMMI can be applied to the organization and business
- Understands the benefits from adopting CMMI
- Determines the applicable Capability Areas, domains, and view
- Develops a business case for adoption
- Learns that CMMI can integrate with other standards



An organization must first understand its reasons for improvement and change. Communicating with an organization's owner or sponsor, typically a senior or executive manager, throughout the improvement journey is vital to achieve success and drive change.

To obtain the commitment necessary for a successful CMMI adoption, it is important to:

- Establish a common understanding of CMMI
- Explain how CMMI provides value to the organization
- Secure senior management support and sponsorship
- Understand how to leverage existing processes and systems

This step establishes a foundation for understanding CMMI and how it fits into an organization's efforts to improve performance and capability. The next step is to establish business and improvement objectives and identify the areas in CMMI that can help address the organization's needs. [Figure 5. Step 1 Activities and Considerations Table](#) provides a summary list of the key Step 1 activities and considerations.

Senior Management: Senior management is a leadership role within an organization that:

- Sets the strategy, direction, and expectations for performance and process efforts
- Ensures that processes are aligned with Business Objectives and needs
- Reinforces and rewards the development and use of processes to ensure their improvement and sustainment
- Monitors the performance and achievements of the processes
- Provides adequate resources for process and performance improvement

Figure 5. Step 1 Activities and Considerations Table

Activities	Considerations
Develop a basic understanding of CMMI: • What is CMMI? • Who uses CMMI? • How does it help? • What benefits does it provide?	Research information about CMMI. Visit the CMMI website for information about: • Explore the CMMI Model • General CMMI information • Frequently Asked Questions (FAQs) • Building Organizational Capability class • CMMI Tech Talks • CMMI Case studies • CMMI Crosswalks
Develop a basic understanding of how CMMI Capability Areas, domains, and views apply in the organization.	Based on the basic understanding of the model, at a high-level, determine how CMMI Capability Areas, domains, and views fit the organization. For example, identify how <i>Planning and Managing Work</i> relates to the management of the organization's projects, or how <i>Ensuring Quality</i> can be used to improve product and Capability Areas: A group of related Practice Areas that can provide improved performance in the skills and activities of an organization or project. A Capability Area view may be selected to enable a concentration on skills and activities in a specific focal area.

Activities	Considerations
	service quality. Determine which domains and views are applicable to the organization by considering: • Contractual requirements • Applicable industry laws, regulations, and other mandates, e.g., General Data Protection Regulation (GDPR) • Industry standards and methodologies being used within the organization • Security requirements in products, services, and supply chain • Security threats and vulnerabilities • Safety considerations, e.g., social distancing requirements
Develop a business case.	Based on a high-level understanding of CMMI and how it fits the organization, develop a business case and present to senior management to secure sponsorship and commitment. Consider the following questions in preparing the business case: • What is the current budget for the performance improvement initiative? • What existing capabilities does the organization already have in place, and how well do they compare to industry best practices? • Does the organization currently have experience with CMMI? If so, would the organization benefit by incorporating additional domains or views, e.g., Data, People, Security, Safety, Agile Development, Artificial Intelligence. • What factors contribute to the timeframe and resources for the initiative? • What are the risks of not proceeding, including considerations of probability of occurrence and severity if realized, e.g., fines due to lack of compliance with regulations, risk to reputation, estimated impact of service or system downtime? The Harvard Business Review (HBR) has published a resource for developing a practical business case: • "HBR Guide to Building Your Business Case," https://hbr.org/product/hbr-guide-to-building-your-business-case/15038-PBK-ENG • "HBR Guide to Building Your Business Case (audible)," https://www.audible.com/pd/HBR-Guide-to-Building-Your-Business-Case-Audiobook/B0BM3CRBZ6

Additional Information

With any improvement effort, change is inevitable. For improvement efforts to be successful, change must be expected, planned for, and managed. Organizations that have successfully managed change know how to overcome the natural resistance that results from it. Resistance to change comes in many forms and often starts early in the improvement process. As part of looking at CMMI for its performance and improvement efforts, the organization must also address how it manages change and any potential resulting resistance. Most notably, many organizations have previously taken a compliance-only approach with process improvement, which frequently results in additional overhead and cost versus clear capability enhancement and performance gains. Making a shift from a compliance mentality to a continuous performance improvement mentality and culture needs to be actively and consistently addressed as part of adoption and implementation. There are several critical elements needed to make change successful. [Figure 6. Critical Elements for Successful Change](#) shows the elements needed for successful change and what can happen if those elements are not addressed.

At the beginning of implementing any change, an organization must communicate:

- The reason for the change
- The expected benefits
- The support and guidance needed to incorporate the change into projects
- How individuals are affected
- The need to involve everyone in the change

Figure 6. Critical Elements for Successful Change

Vision	Skills	Incentives	Resources	Action Plan	
●	●	●	●	●	Success!
	●	●	●	●	Confusion
●		●	●	●	Anxiety
●	●		●	●	Gradual Change
●	●	●		●	Frustration
●	●	●	●		False starts

Derived from: Delorise, Ambrose. "Managing Complex Change." The Enterprise Group, Ltd.
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The [Organizational Behavior Toolkit](#) provides organizations with indicators of how an organization's culture and behavior may support or hinder sustainable process capability and performance improvement efforts. The Organizational Behavior Toolkit is leveraged by an organization, at any time, to assess behavioral maturity and changes to critical behaviors that influence and impact organizational performance. For example, this may occur at the beginning stages of a performance improvement journey, at the end of a significant milestone for the organization, or anything in between, e.g., an international event like the COVID-19 pandemic, significant economic changes within the country such as war or civil unrest. The organizational behavior survey and its resulting analysis gauges the overall characteristics and behavioral patterns that are critical for an effective performance improvement culture. While a CMMI appraisal determines the organization's process maturity or capability, compared to the CMMI reference model and relevant views, the Organizational Behavior Toolkit provides a rapid and reliable quantitative means to benchmark and monitor organizational behavior. Refer to [Step 6: Assess capability and performance](#) for more information on a conducting a CMMI appraisal.

An integral tenant of CMMI is learning about the organization and the people working in it. By learning more about the organization, it becomes easier to:

- Understand its culture and norms
- Identify and manage possible areas of resistance
- Learn the key issues driving behavior

Learning about and applying CMMI are often the easiest aspects of performance improvement. Understanding the organizational culture and dealing with resistance are typically the most difficult parts of any change effort. The existing organizational culture may either enhance or slow down the adoption of CMMI.

Adoption Tip: Developing a communication and stakeholder management plan can help to keep the channels open when resistance is encountered. Recording Frequently Asked Questions (FAQs) can help to ensure consistency in messaging and understanding.

It is important to know the issues that matter to each group in the organization. For example, senior managers and executives typically focus on financial concerns and overall impact on the organization. They may ask questions such as:

- How much is this going to cost?
- How much time is this going to take away from projects?
- How much revenue will this produce?
- How much profit will this add to the bottom line?
- What is the anticipated return on investment?
- How does this affect my people?
- What does it take to implement the change?
- How do the current processes reduce adoption time and cost?

Expect these questions to start early in the improvement effort and to continue throughout. To manage change successfully, plan to address the issues and questions that are raised by each group in the organization. Be prepared to answer questions like these without using CMMI terminology or technical jargon. Communicate in terms that are understood and used within the organization whenever possible.

Obtaining senior management support is often the most critical element of successful change. Senior management should demonstrate active commitment, support, and behavior in championing the improvement changes.

Adoption Tip: Even if your management, projects, and teams are familiar with CMMI it is important to understand and frequently communicate the improvements in the newest version of CMMI. CMMI covers multiple domains, e.g., Data, Security, Safety, People, Suppliers, Virtual that could be beneficial to how your organization is doing work. CMMI Institute has information and materials to explain the benefits from adopting CMMI. For example, the Performance Summary Report contains C-suite appropriate information on expected performance benchmarks. This information can be used to justify the CMMI Return on Investment (ROI).



ESTABLISH OBJECTIVES

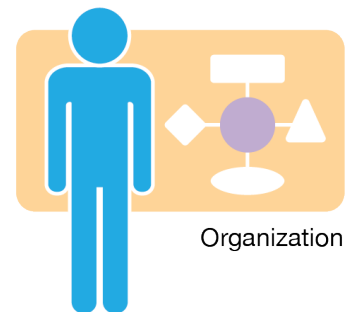
Step 2: Establish performance improvement objectives aligned to your organizational objectives

In this step, the Sponsor works with the organization to:

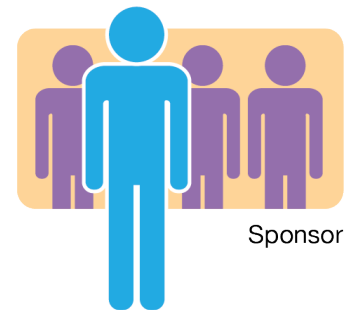
- Identify the most critical objectives to business success
- Establish performance improvement objectives based on the organization's Business Objectives
- Understand which parts of CMMI relate to these performance improvement objectives
- Identify infrastructure needs to support improvement efforts
- Identify measures of success for meeting objectives
- Develop an improvement plan and keep it updated
- Communicate continually with stakeholders
- If adopting AI, incorporate AI considerations within the performance improvement objectives

The Sponsor may decide to obtain assistance from a CMMI Partner while working to complete the activities of this step. For additional guidance, refer to the [CMMI Tech Talk: How to Get Started with CMMI](#) on how to choose a reputable consultant to help your organization on its performance improvement journey.

All organizations typically have some idea of their Business Objectives. Identify and prioritize the business challenges and issues that are putting the most important objectives at risk or preventing them from being met. Keeping each of these elements aligned is important to ensure that the right improvements are being addressed.



Organization



Sponsor

Figure 7. [Step 2 Activities and Considerations Table](#) provides a summary list of the key Step 2 activities and considerations.

Figure 7. Step 2 Activities and Considerations Table

Activities	Considerations
Record business needs and objectives.	List business goals, risks, and Key Performance Indicator (KPI) measures. Refer to Appendix E: Building Goals, Risks, and KPIs. This step corresponds to and can be supported by the Practice Areas and Capability Areas contained in the CMMI Category “Doing.” Start by identifying any existing business goals, objectives, and strategic plans. Work with managers and affected stakeholders to define organizational needs and objectives. Affected stakeholders should include the people performing the work, as they have the most insight into issues and challenges. Include both short-term and long-term objectives. Evaluate the importance of security and safety requirements, and any integration and interface or connection dependencies between them, to the organization. Ensure the set of business needs and objectives appropriately reflect the performance needs of the business. A Certified CMMI Lead Appraiser can use the CMMI Performance Report as a template for recording this information and ensuring your CMMI journey focuses on the most important aspects of your business. Adoption Tip: A key feature of the CMMI Performance Solutions ecosystem is the Performance Report. This simple, but powerful template provides a straightforward means to identify and track key business and performance measures. The report is a required artifact in the appraisal method for specific appraisal types, and available through a Certified CMMI Lead Appraiser.
Record performance improvement objectives.	Performance improvement objectives: • Are derived from organizational business needs and objectives • Focus on addressing challenges or issues affecting the current projects • Drive the critical measurements for improvement • Incorporate applicable security and safety requirements
Prioritize business and performance improvement objectives.	Prioritize objectives based on the value to the organization, risks, and constraints.
Develop measurable targets for	Measurable targets: • Are meaningful to the organization • Address effectiveness of the improvements

Activities	Considerations
performance improvement objectives.	- Assess progress towards achieving objectives Targets should be: Specific – also simple, sensible, and significant and answers the questions: "What is to be done?" and "How will you know it is done?" and describes the results (product) of the work to be done. The description is written in such a way that anyone reading the objective most likely observes and interprets it the same way operationally. Observable means that somebody can see or hear (physically observe) someone doing something. Measurable – also meaningful and motivating and answers the question: "How will you know it meets expectations?" and defines the objectives and their related measurements using assessable terms (quantity, quality, frequency, costs, deadlines, productivity, etc.). It refers to the extent to which something can be evaluated against some standard. An objective with a quantity measurement uses operational terms for such things as amount, percentages, etc. A frequency measurement could be daily, weekly, 1 in 3. An objective with a quality measurement would describe a requirement in terms of accuracy, format, and completeness. Achievable – also attainable and agreed upon and answers the questions: "Can the organization, project or person reasonably accomplish the objective given?" It also includes the answer to: "Do they have the experience, skills, knowledge, capability and capacity for fulfilling the expectation?" and "Can it be done given the timeframe, opportunity, and available resources?" Relevant – also reasonable, realistic, and resourced, and answers the questions: "Should it be done?" "Why are we doing this?" and "What will be the impact?" Does the objective and measure align well with the organizational strategic and tactical needs, plans, and approach? Time-bound – also time-based, time limited, time/cost limited, timely, time-sensitive and answers the questions: "When will it be done?" Sometimes a task has several milestones or checkpoints to help assess how well something is going before it is finished so that corrections or modifications can be made to make sure the result meets expectations.
Target Practice Areas that relate to the prioritized performance improvement objectives.	Based on a high-level understanding of the Capability Areas identified in Step 1, review the Practice Areas in each that address the objectives and improvements challenges directly. There are many approaches that may work in an organization; the challenge is to couple this deep understanding of CMMI with knowledge about the unique aspects of the business and organization.

Activities	Considerations
	A CMMI Partner-Sponsored Individual can help an organization perform this task. • These professionals bring deep knowledge of CMMI and how to apply it in a variety of organizational contexts. • Refer to the CMMI Partner Directory for CMMI Partner-Sponsored Individuals that meet your business needs
Establish the infrastructure to support and implement improvements.	To ensure long-term success, performance improvement efforts require an infrastructure that is sustainable over time. Organizations need to identify who is involved in improvement activities and define their roles and responsibilities. Typical roles include: • Senior management • Improvement sponsor • Management steering group • Process group • Process action teams Additional infrastructure resources may include: • Budget • Time • Tools • Training • Repository for process assets • Measurement system and repository For more details on infrastructure and sustainment, refer to content in the following CMMI Practice Areas: • Implementation Infrastructure (II): Ensures that the processes and assets important to an organization's performance are habitually and persistently followed, used, and improved. • Governance (GOV): Provides guidance to senior management on their role in the sponsorship and governance of performance, processes, and related activities. • Process Asset Development (PAD): Develops the process assets necessary to perform the work and keeps them updated. For more details on measurement and performance objectives, review the content in the following CMMI Practice Area: • Managing Performance and Measurement (MPM): Manages performance using measurement and analysis to achieve Business Objectives.
Record all the above in an improvement plan, keep it	The improvement plan for adoption may include a set of requirements, a budget, a schedule, risks, dependencies, stakeholders, etc.

Activities	Considerations
updated, and communicate with stakeholders.	For more details on what to include in an improvement plan, review the content in the following CMMI Practice Area: • Process Management (PCM): Manages and implements the continuous performance improvement of processes and infrastructure to meet Business Objectives by identifying and implementing the most beneficial process improvements and making performance results visible, accessible, and sustainable.

Additional Information

Refer to the appendices in this document for more information on:

- Typical CMMI Adoption Roles and benefits ([Appendix D: Typical CMMI Adoption Roles](#))
- Problem Identification and Resolution using CMMI ([Appendix C: Problem Identification and Resolution Using CMMI](#))

The following sources can be used when identifying business challenges and related opportunities for improvement:

- Stakeholder input
- Customer feedback
- Improvement proposals
- Risks and opportunities
- Lessons learned
- Results from appraisals
- Results from root cause analysis
- Measurements results
- Quality evaluations or audits

When establishing measurable targets, an organization may want to consider using the following resources:

- [American Society for Quality \(ASQ\) - What are Performance Metrics?](#)
- [International Organization for Standardization \(ISO\) 10012:2026 – Quality management — Requirements for measurement management systems](#)
- [Society of Automotive Engineers \(SAE\) J2944 Operational Definitions of Driving Performance Measures and Statistics](#)
- [Goal-Question-Metric approach](#) to derive meaningful measures from objectives
- [Goal-Driven Software Measurement](#) designed to help you identify, select, define, and implement measures to support your business goals

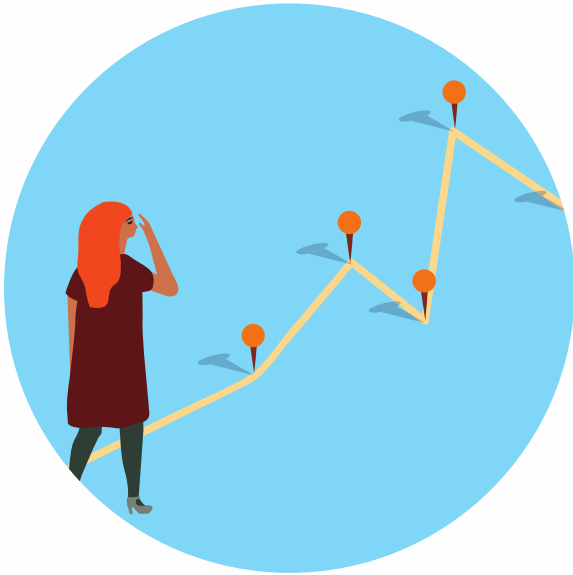
Adoption Tip:

In the CMMI Performance Solutions ecosystem, the term “High Maturity” involves the use of statistical and other quantitative techniques on selected processes to predict improved business results. High Maturity represents a fundamental shift in how processes are understood, managed, and improved. As organizations move up in process maturity, they gain in-depth understanding of how processes are used and interact, which gives them a clear competitive advantage. Based on actual Performance Report data, High Maturity organizations have demonstrated clear and outstanding improvements in achieving operational goals.

Some items to consider as part of performance improvement efforts include:

- Communication and collaboration with the improvement sponsor and senior management when building the case for performance and process improvement
- Records of previous improvement activities, including issues, decisions, and action items
- Processes in use within the organization
- Regulatory and standard compliance
- Use of terminology that is familiar to the audience by avoiding technical jargon or CMMI terminology
- Determination of the type and frequency of written communication and updates (verbal or written)

The objectives must be clearly communicated to the entire organization. If people understand the reasons for the change and the desired outcome along with their role in making the change, the amount of potential resistance can be reduced.



ANALYZE

Step 3: Map current organizational processes to CMMI

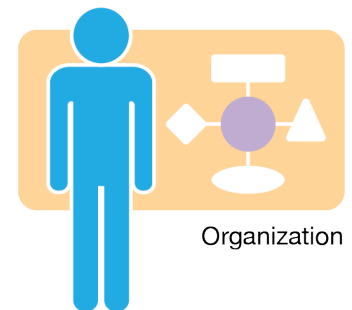
In this step, the organization, on their own, or with the help of a CMMI Consultant:

- Maps current business processes to CMMI components and practices
- Identifies any gaps between the business processes and the CMMI components and practices identified for improvement
- Recommends improvements to address the gaps

This step corresponds to and can be supported by the Practice Areas and Capability Areas contained in the CMMI Category “Enabling.”

It is important to understand the processes currently used in the organization and the extent to which these processes meet the intent, value, and any additional required information of the CMMI Practice Areas and Practices. This is an important step as it forms the basis of future improvement activities. If an organization is adopting AI, evaluate the AI usage scenarios along with any defined AI governance when identifying process gaps. The CMMI AIM view defines the following AI usage scenarios:

- Autonomous Augmentation
- Verified Augmentation
- Support Augmentation
- AI Solution



Organization



CMMI Consultant

[Figure 8. Step 3 Activities and Considerations Table](#) provides a summary list of the key Step 3 activities and considerations.

Figure 8. Step 3 Activities and Considerations Table

Activities	Considerations
Perform gap analysis of current processes against the CMMI Practice Areas identified for improvement.	Gap analysis information provides a reference for people in the organization to understand how their processes relate to CMMI components and practices. This information also forms the basis for developing action plans for performance improvement in the next step. The gap analysis may use a formal appraisal method such as a CMMI Evaluation Appraisal. If the organization already holds an industry certification in one of the standards that currently have a CMMI Crosswalk, the detailed mapping provided by the crosswalk can expedite the mapping of the organization's current processes and identifying any remaining gaps. Alternatively, the gap analysis may be performed informally by doing a simple comparison of selected processes to CMMI Practice Areas and other model components, e.g., domains, context specific information. When security is an important domain for the organization, consider the relationships of security with Practice Areas throughout CMMI. Refer to Appendix G: CMMI Practice Area Security Adoption Examples, which provides example relationships of security to Practice Areas. This analysis does more than just identifying gaps in the processes being used. It also involves determining if the processes are utilized, persistent, and habitual. A well-crafted business process is of little value if it is not used. A CMMI Partner-Sponsored Individual can help an organization perform this task. Refer to the CMMI Partner Directory for CMMI Partner-Sponsored Individuals to meet your business needs. If an organization is looking to adopt the CMMI AIM, a gap analysis can allow the organization to understand how AI is used within their organization against industry best practices. Whether they are building an AI solution or using an AI solution, it is important to understand the context and what AI usage scenarios are relevant.

Activities	Considerations
Record the results of the gap analysis.	Use a consistent method to record the gaps. This activity should be connected to the one below to aid in tracking each gap to activities in the action plan.
Develop and record recommended improvement activities in the action plan to close all identified actions and gaps.	Recommendations form the basis for improvement action plans. For more details, review the content in the following CMMI Practice Area: • Process Management (PCM): Manages and implements the continuous performance improvement of processes and infrastructure to meet Business Objectives by identifying and implementing the most beneficial process improvements and making performance results visible, accessible, and sustainable.



DEVELOP ACTION PLAN

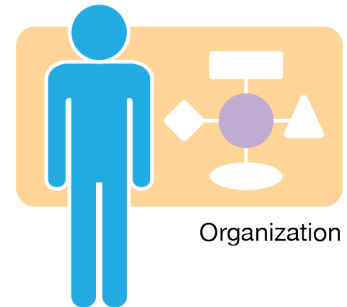
Step 4: Develop and follow action plans, and keep them updated

In this step, the organization:

- Develops an improvement strategy
- Develops action plans to address performance and process gaps identified in the previous step
- Makes changes or improvements
- Defines or updates processes

The Sponsor, on behalf of the organization, may appoint a Process Group to support action plan development, or solicit support from a CMMI Consultant.

This step corresponds to and can be supported by the Practice Areas and Capability Areas contained in the CMMI Category “Managing.”



The step begins by developing the organizational improvement strategy and obtaining commitment from all stakeholders. The strategy includes identifying the benefits of capability and performance improvement and the impact to organizational Business Objectives.

The improvement strategy requires a firm commitment from the improvement sponsor. Active sponsorship is critical to ensure that the plan and the required resources are available throughout the improvement effort.

This step also includes the development of improvement action plans to address the gaps identified in the previous step and to move the organization towards achieving its objectives. Performing these activities may result in defining or updating processes and making other changes needed to address process gaps. As with any plan, it is important to keep the action plans updated as activities are added, modified, or removed.

As the organization progresses through the action plans, monitor performance to ensure that the desired results are achieved. Performance and results should tie back to the organizational business improvement goals defined in the strategy. [Figure 9. Step 4 Activities and Considerations Table](#) provides a summary list of the key Step 4 activities and considerations.

Adoption Tip: Action plans should contain clear and measurable information on when and how actions are considered closed. By prioritizing those actions that have the greatest impact on the business and performance rather than compliance, it is easier to convince senior management and stakeholders because the improvements are of value and need to be sustained over time.

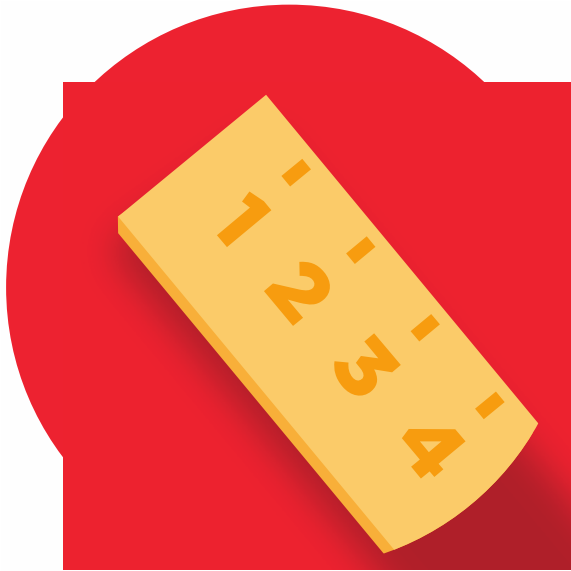
Figure 9. Step 4 Activities and Considerations Table

Activities	Considerations
Develop and follow an improvement strategy and keep it updated.	An improvement strategy typically includes: • Business considerations • Objectives and constraints • Possible approaches to meeting the objectives and constraints • Requirements • Needed resources, e.g., skills, environment, tools, new technologies • Security requirements and considerations • Safety requirements and considerations • Risks and how they will be mitigated
Establish priorities for improvement actions.	Prioritize improvement actions based on the value to the organization, resource constraints, and the impact on achieving performance objectives. This helps gauge how much work is ahead and the order in which items should be addressed.
Develop action plans to address all actions and gaps.	The action plans define all aspects of the effort, tying together the following in a logical manner: • Tasks • Roles and responsibilities • Budgets

Activities	Considerations
	• Schedules and milestones • Risks • Resources and skills • Stakeholder involvement For more details, review the content in the following CMMI Practice Areas: • Estimating (EST): Estimates the size, effort, duration, and cost of the work and resources needed to develop, acquire, or deliver the solution. • Planning (PLAN): Develops plans to describe what is needed to accomplish the work within the standards and constraints of the organization. • Implementation Infrastructure (II): Ensures that the processes and assets important to an organization's performance are habitually and persistently followed, used, and improved. • Governance (GOV): Provides guidance to senior management on their role in the sponsorship and governance of performance, processes, and related activities.
Review plans with the improvement sponsor to obtain commitment and approval.	Verify and confirm continued visible senior management's active engagement, sponsorship, and support for the improvement efforts.
Make changes or improvements based on the action plans.	Remember, even though some changes may be easy to implement, they may take a long time to roll-out and to become persistent and habitual.
Define or update processes where appropriate.	• Record the processes the way they are performed. • Refer to Appendix F: Define Your Current Processes for more information on recording processes. • A CMMI Partner-Sponsored Individual can help an organization perform this task; refer to the CMMI Partner Directory to find a CMMI Partner-Sponsored Individual.

Additional Information

It is important to involve the people affected by the changes in making the improvements. This increases buy-in and reduces resistance to the changes.

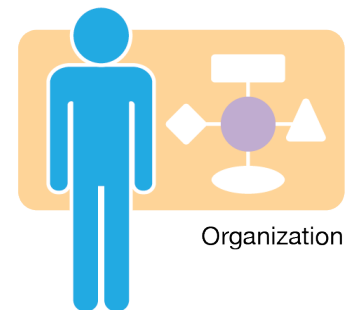


DEPLOY IMPROVEMENTS

Step 5: Deploy improvements and measure results

In this step, the organization:

- Pilots new and changed processes
- Deploys new and changed organizational processes and assets
- Measures the performance of newly deployed organizational processes and assets against the business and performance improvement objectives



This step corresponds to and can be supported by the Practice Areas and Capability Areas contained in the CMMI Category “Improving.”

This step involves piloting and deploying the performance and process improvements identified in action plans from the previous step, typically an iterative process. Improvements are often rolled out gradually to assess performance. Piloting improvements enables an organization to evaluate the impact of performance improvements to ensure they are successful before wider deployment. Deployment involves managing the implementation of new or updated processes in a consistent and sustainable way. There may be multiple improvement initiatives, concurrent improvements, and deployments in an organization. Coordinate the deployment of processes to avoid confusion, waste, contradictory results, and adverse effects.

As performance improvements are deployed, care should be taken to ensure that processes are built, followed, and made

Adoption Tip: Not every improvement may scale as it is deployed on a broader basis. Piloting improvements helps to understand which improvements have the greatest impact and benefit for the entire organization.

persistent and habitual. [Figure 10. Step 5 Activities and Considerations Table](#) provides a summary list of the key Step 5 activities and considerations.

Figure 10. Step 5 Activities and Considerations Table

Activities	Considerations
Measure performance of existing processes and their targeted improvements.	As the organization accumulates historical data, process performance can be measured. Historical data may be used to identify performance differences between current and improved processes.
Develop, keep updated, and follow a process deployment plan.	The deployment plan typically includes the following: • Deployment strategy • Improvement requirements • Estimated budget, schedule, risks, etc. • Updated and new process information • Communication methods • List of affected stakeholders • Training • Implementation expectations
Pilot new or changed processes.	Define and use criteria for selecting which improvements to pilot. Typical criteria include: • Risk • Impact of change • Number of projects affected • Cost • Expected results
Analyze results of pilots.	Use results from pilots to: • Compare performance results of the pilot to existing performance measures • Determine if the pilot is sufficiently successful to deploy the process to other parts of the organization • Evaluate Return on Investment (ROI) • Make changes to the piloted process • Update the deployment plan as needed
Deploy processes as appropriate.	Establish the necessary infrastructure to ensure that processes are built, followed, sustained, and improved over time. The term "infrastructure" refers to everything needed to implement, perform, and sustain the organization's set of processes. The infrastructure includes: • Recorded processes • Resources, e.g., people, tools, consumables, facilities • Funding to perform the processes

Activities	Considerations
	• Training to perform the processes • Objective evaluations to ensure that work is performed as intended
Monitor adoption of recently deployed improvements.	Continue to monitor the process over time by reviewing: • Organization's performance measures • Organization's applicable security activities, steps, and measures • Organization's applicable safety activities, steps, and measures • Comparison of historical performance to the performance of new or updated processes • Habit and persistence in the use of and continuous improvement of the processes and assets By monitoring improvement adoption and performance against organizational Business Objectives, an organization can verify and quantify the benefits of the improvements. This activity may also result in new opportunities for improvement and updates to action plans. For more details on deployment improvements and measuring results, review the following CMMI Practice Areas: • Process Management (PCM): Manages and implements the continuous performance improvement of processes and infrastructure to meet Business Objectives by identifying and implementing the most beneficial process improvements and making performance results visible, accessible, and sustainable. • Managing Performance and Measurement (MPM): Manages performance using measurement and analysis to achieve Business Objectives.

Additional Information

To avoid overwhelming stakeholders, it may be necessary to select and deploy different improvements to different parts of the organization at different times. The selection of improvements to deploy should be based on the criteria described above and should also be sensitive to the needs of the various parts of the organization.

Monitoring implementation confirms that the improvements are effectively deployed. It also helps to understand:

- What assets are being used
- Why they are being used
- Where they are being used
- How they are being used

As processes become habitual and persistent, they become an integral part of the organization's norms and culture. Habitual and persistent processes endure after the people who defined them are gone.

Review the measures collected to understand performance over time to determine if the collected performance data is relevant and critical to the work and to the business or if it needs to be changed. An organization may not get it right the first time, so it should review the data and adjust plans accordingly.



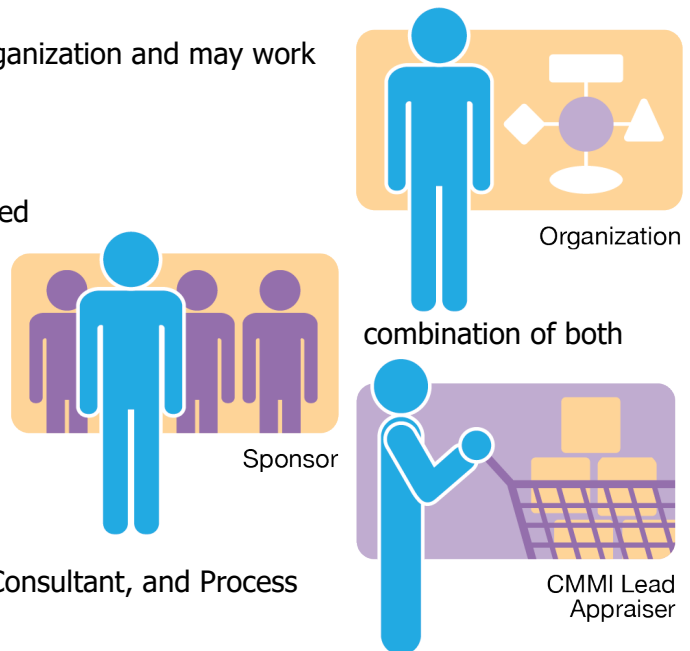
ASSESS CAPABILITY

Step 6: Assess capability and performance

In this step, the Sponsor works with the organization and may work with a CMMI Lead Appraiser to:

- Assess processes and assets
- Measure and assess performance
- Update improvement plans as needed
- Continue the improvement journey

Organizations typically conduct a informal and formal assessments, to maintain an appropriate level of momentum for performance improvement initiatives. As such, the Sponsor works with various roles to define an approach for periodic assessments of capability, including the CMMI Lead Appraiser, CMMI Consultant, and Process Group Members.



This step corresponds to and can be supported by the Practice Areas and Capability Areas contained in the CMMI Category “Improving.”

This step involves appraising processes and the improvements made to them, and then brings the CMMI adoption cycle full circle and back to assessing the impacts of those improvements on performance.

There are multiple ways to assess capabilities and performance including:

Adoption Tip: Conducting CMMI appraisals is a proven best practice to ensure the most efficient and effective improvement results. CMMI-based appraisals provide reliable, clear, consistent, and actionable focus on performance improvements that have the most impact on the business and help build and improve capability.

- Conducting internal appraisals or process reviews against CMMI
- Partnering with a CMMI Partner-Sponsored Individual to conduct appraisals, e.g., CMMI Evaluation Appraisal, CMMI Benchmark Appraisal, CMMI Sustainment Appraisal

It is important that organizations validate that their processes and performance are in alignment with business and performance improvement objectives. CMMI appraisals assist in:

- Demonstrating the value of improvements to the business
- Motivating stakeholders for continued buy-in
- Driving continuous improvement
- Determining competitive position in the market

[Figure 11. Step 6 Activities and Considerations Table](#) provides a summary list of the key Step 6 activities and considerations.

Figure 11. Step 6 Activities and Considerations Table

Activities	Considerations
Assess processes and assets.	Assess progress against the improvement plan at an appropriate frequency.
Assess performance results against performance and Business Objectives.	The results from this assessment should help to inform and drive the next iteration of improvement.
Update improvement and action plans and continue the improvement journey.	Improvement is not a one-time effort. As organizations complete activities, they should plan for the next iteration in a continuous improvement journey.

Additional Information

An organization may want to achieve formal recognition of the effectiveness of their processes. This can serve as both an internal validation of the value and benefits gained from continual improvement efforts and an external acknowledgement of the organization’s commitment to quality and continuous performance improvement.

Formal recognition can be gained through conducting a CMMI Benchmark Appraisal. If the organization plans to conduct a CMMI Appraisal, a Certified CMMI Lead Appraiser must lead the

appraisal. The results of a CMMI Benchmark Appraisal can be used to compare the organization to other organizations in their industry.

The continuous improvement journey may involve:

- Evolution of the organization's Business Objectives
- The need for improved performance
- New areas for improvement

Once this step is completed, repeat the cycle by going back to Step 1 to learn about any new updates made to the CMMI Performance Solutions ecosystem. Refer to [Figure 12. Adoption Guidance Cycle](#).

Figure 12. Adoption Guidance Cycle

Appendix A: Additional Resources

This Appendix contains a list of resources that are part of the integrated CMMI Performance Solutions ecosystem to aid organizations with successful adoption. [Figure 13. CMMI Adoption Resources](#) provides a summary of adoption resources available.

Figure 13. CMMI Adoption Resources

Resource	Purpose
CMMI Account Dashboard	Register for an account on the CMMI website or log in to an existing account to find materials that you have purchased or to which you have access based on your certified role. Based on your access, you will find links to the CMMI Model Viewer, course materials, and other resources on the dashboard.
CMMI Acquisition Handbook	The CMMI Acquisition Handbook provides guidance for addressing and verifying CMMI requirements in contracts and acquisition efforts, including the essential who, what, when, why, and how information about using CMMI in the Federal Contracting Industry.
CMMI Adoption Guides for Credentialing	The purpose of these Adoption Guides for CMMI Credentials is to provide CMMI students and certification Candidates with technical information and references to prepare for CMMI courses and to prepare and study for CMMI exams and CMMI observations.
CMMI Crosswalks	The CMMI Crosswalk - AI Bundle provides detailed mappings of the CMMI Practice Areas and practices to the relevant AI industry standards and the mapping relationships.
CMMI Partner Directory	The CMMI Partner Directory is a searchable database of highly trained individuals in organizations trusted to deliver quality, leading-edge CMMI services and technologies throughout the global business community. Organizations looking to get an appraisal, obtain training, or receive consulting on implementing CMMI processes in their organization can find a CMMI Partner to help.
CMMI Policies	The CMMI Policies page provides access to appraisal, certification, partner, quality, and training policies.
CMMI Resource Center	The CMMI Resource Center is a collection of every CMMI digital resource in one place. Browse through the collection of presentations, webinars, articles, case studies, whitepapers, and more.
CMMI Tech Talks	The CMMI Tech Talks provide a variety of microlearning's to assist in CMMI adoption. CMMI Tech Talks cover a variety of areas from model interpretation, training, appraisals, CMMI and other frameworks, and more.
CMMI Technical Report: Performance Results	The CMMI Technical Report: Performance Results provides an annual summary of organizations' consistent achievements of their business goals from nearly 24,000 independently

Resource	Purpose
	conducted, and approved appraisals, since CMMI Performance Solutions launched in 2019.
CMMI Training Resources	Find CMMI and CMMI Partner training resources, class schedules, and information about training and certification options on the CMMI Training Resources page.
CMMI Model Quick Reference Guide	This guide is a condensed look at the complete CMMI Model, including a summary of Capability Areas, Practice Areas, and practice group levels. This summary provides a helpful overview of the Model content areas and what you can expect to see within a full Model Viewer Subscription.
CMMI Website	The CMMI website provides resources and information about offerings to support capability and performance improvement.
Customer Support Center	The Customer Support Center provides individuals and organizations with proactive support and speedy solutions to questions. You can review the Frequently Asked Questions (FAQs) or submit a support request at https://support.isaca.org/s/ .
Published Appraisal Results System (PARS)	The Published Appraisal Results System (PARS) publishes the CMMI level achieved by organizations who have granted permission for their Benchmark or Sustainment Appraisal results to be posted. Evaluation Appraisals are not currently published.

Additional References

CMMI Adoption Guidance contains references to a few external resources. These resources are cited below.

- Park, Robert E., Wolfhart B. Goethert, and William A. Florac. [Goal-Driven Software Measurement: A Guidebook](#). Pittsburgh, PA: Carnegie Mellon University, Software Engineering Institute, 1996.
- Gray, Douglass. [Applying the Goal-Question-Indicator-Metric \(GQIM\) Method to Perform Military Situational Analysis](#). Pittsburgh, PA: Carnegie Mellon University, Software Engineering Institute, 2016.
- International Organization for Standardization. ISO 9001:2015 Quality management systems - Requirements. ISO, 2015. https://www.iso.org/iso/iso_catalogue/.
- Sheen, Raymond, and Amy Gallo. [HBR Guide to Building Your Business Case](#). Boston, MA: Harvard Business Review Press, 2015.

Solingen, Rini Van, Vic Basili, Gianluigi Caldiera, and H. Dieter Rombach. "[Goal Question Metric \(GQM\) Approach](#)." Encyclopedia of Software Engineering, 2002. doi:10.1002/0471028959.sof142.

Appendix B: CMMI Categories, Capability Areas, and Practice Areas

Figure 14. [Categories, Capability Areas, and Practice Areas](#) lists the model components of the CMMI.

Figure 14. Categories, Capability Areas, and Practice Areas



Appendix C: Problem Identification and Resolution Using CMMI

[Figure 15. Problem Identification and Resolution Using CMMI](#) lists common business problems, their possible underlying causes, and the CMMI Practice Areas (PAs) that could help.

For a list of CMMI Practice Areas, refer to [Figure 14. Categories, Capability Areas, and Practice Areas](#) in [Appendix B: CMMI Categories, Capability Areas, and Practice Areas](#).

Figure 15. Problem Identification and Resolution Using CMMI

Business Problem	Underlying Causes	Potential CMMI PA Solution
Delivered solutions do not meet customer needs	- Wrong solution delivered - Bad requirements - Poor testing - No stakeholder feedback - Lack of customer involvement	PLAN, PR, RDM, PQA, SDM, STSM, VV
Customer complaints	- Inconsistent delivery - Rude personnel - Always have an excuse - Quality issues - Service levels not met	EST, PQA, RDM, SDM
Late delivery	- Poor/no estimating or planning - Poor progress tracking - Lack of critical resources - Excessive overtime - Too much rework - Constantly changing requirements - Unexpected external incidents or other disruptions	EST, IRP, MC, PLAN, RDM, RSK
Disruptions to operations caused by global events or environmental impacts	- Worldwide events, e.g., COVID-19, causes fundamental shift in business operations - Entire workforce must shift to virtual or remote delivery - Vulnerabilities in virtual delivery exposes organizations to new security disruptions - Lack of adequate planning and preparation for virtual delivery	CONT, ESAF, ESEC, EVW, IRP, MST, PLAN, RSK
Costly solutions	- Poor estimating/planning - Gold plating - Too much rework - Acceptance of too many changes/too much work without understanding impact	CM, DAR, EST, MC, PLAN, RDM, RSK

Business Problem	Underlying Causes	Potential CMMI PA Solution
	Lack of understanding customer needs	
Poor quality	- Badly defined requirements - Attempts to “test quality” into services or products - Lack of time to test - Poor design - Inexperienced technical personnel - Lack of defined processes and procedures	PLAN, PQA, PR, RDM, VV
Vulnerabilities	- Lack of awareness or appropriate prioritization of security needs and requirements - Lack of an approach and infrastructure to address threats, vulnerabilities, and mitigations - No assigned resources, roles, or responsibilities to address security - Lack of continuous monitoring and improvements - Poor security of data (e.g., personally identifiable information (PII))	ESEC, GOV, II, MST, DM
Constantly stretched resources	- Poor/no estimating or planning - Excessive overtime - Wrong resources - Lack of skills needed to do the work - Acceptance of too many changes/too much work without understanding impact - Poor management - Lack of commitment	CM, DAR, EST, MC, PLAN, RDM, RSK, WE
Problems are always a surprise	- Lack of problem anticipation - Poor planning - Short-term organizational “memory” - Sugarcoating - Problem avoidance (“burying head in the sand”) - Lack of corrective or preventative action - No viable responses to problem	CM, CONT, PAD, PLAN, RSK, IRP
Safety mishaps and events interrupt operations	- Lack of a safety approach and infrastructure - Lack of awareness or appropriate prioritization of safety needs and requirements - No assigned resources, roles, or responsibilities to address safety	ESAF
Constant firefighting	- Poor/no estimating or planning - Inexperienced technical personnel - Dependency on heroes for success - Acceptance of too many changes or work without understanding impact	CM, EST, GOV, II, OT, MST, PCM, PLAN, RSK

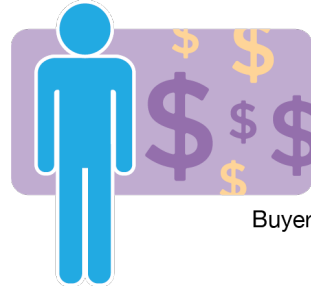
Business Problem	Underlying Causes	Potential CMMI PA Solution
	- Poor management - Lack of commitment	
Poor retention of personnel	- Over reliance on heroes - Poor/no estimating or planning - Excessive overtime - Wrong resources - Acceptance of too many changes/too much work without understanding impact - Poor management - Poor morale - Corporate "brain drain" (loss of key personnel and experience)	CM, EST, OT, PAD, PCM, PLAN, WE
Everything is priority 1	- Poor planning - Poor morale - Excessive overtime - Poor quality - Lack of focus on what is important to the business and performance	DAR, PLAN, RDM
Too much rework	- Poor planning - Excess or unnecessary cost - Poor morale - Excessive overtime - Poor quality	MC, PLAN, PQA, PR, VV
Constantly reinventing the wheel	- No sustainable infrastructure - Lack of clear repeatable process - Sporadic or no training/learning - Lack of focused training for business needs - No organizational memory	DAR, II, PAD, PCM, TS
Supply chain issues	- Lack of clear requirements - Ambiguous or no agreements - Limited selection of solutions - Risks in the supply chain - Lack of clear and consistent responsibilities - Delivery delays - Poor quality	PLAN, PQA, RSK, SAM
Inexperienced personnel and management	- Lack of clear governance - Lack of clear repeatable process - Lack of clear and consistent responsibilities - Sporadic or no training/learning - Lack of focused training for business needs - No organizational memory	GOV, MC, OT, PLAN, PQA

Business Problem	Underlying Causes	Potential CMMI PA Solution
	- Poor resource, skills, and knowledge planning - Poor quality	
Low productivity	- Lack of clear, repeatable processes - Lack of training - Poor morale - Poor accountability - Lack of infrastructure	EST, GOV, II, OT, PLAN
Inconsistent service delivery	- Lack of a collaborative approach between the service provider and customer - Lack of an approved service agreement and lack of adherence to it - Inability to deliver services due to any of the following factors: failure of service components, failure to check readiness of the service system, absence of clear service delivery procedures or lack of awareness about such procedures (if they exist) - Dependency on heroes to deliver services rather than on established practices and procedures	CONT, IRP, PQA, SAM, SDM, STSM
Never finishing	- Incorrect scoping - Incorrect estimation methods - Failure to revise plans and schedules based on changing customer demands - Inadequate resources/incorrect resource estimation and planning - Lack of obtaining commitments from affected stakeholders	EST, II, MC, PLAN, RSK
Never enough time/budget	- Poor planning - Lack of resources - Excess or unnecessary cost - Poor monitoring - Excessive overtime	EST, GOV, MC, PLAN, RSK
Constant requirements changes	- Incorrect and/or incomplete change management process - Lack of clearly understood requirements process - Weak or inadequate validation, verification, and peer review processes	CM, MC, PLAN, PR, RDM, VV
Poor decision making	- Not sure of the exact "problem" (and so not able to define the problem statement) - Lack of relevant and adequate skill sets to use decision-making techniques and to determine the risks and impacts of decisions	DAR, II, OT, PLAN, SAM, TS, DQ

Business Problem	Underlying Causes	Potential CMMI PA Solution
	• Not making data driven decisions or making decisions based from incomplete or poor data • Not involving affected stakeholders during problem definition and/or decision-making process • Taking decisions based on “assumptions” rather than on actual (measurable and verifiable) data • Inability to identify criteria for evaluation of alternatives • Inability to identify alternatives for particular problem • Inability to define a problem from a state of confusion	
Incorrect version released to customer	• Insufficient configuration management processes and infrastructure to support version management • Lack of version control • Unclear authoritative source • Unclear integration and interface or connection requirements	CM, PI
Poor AI Model performance	• Data quality issues • Insufficient training • Data bias • Overfitting • Poor feature engineering • Incorrect algorithms	DM, DQ, PLAN, RDM, TS, VV
Inappropriate use of AI systems	• Poorly defined processes • Unclear/ineffectual policies • Insufficient oversight • User over-reliance • Malicious intent	PAD, PCM, PQA, GOV
Lack of Return on Investment (ROI) on AI investment	• No clear vision or tie to achievement of business objectives • Lack of organizational commitment • Inability to scale successes • Lack of knowledge • Insufficient oversight • Lack of processes around AI use and expectations • Lack of AI integration into key business processes • Data quality issues	DQ, GOV, II, OT, PAD, PCM, PLAN

Appendix D: Typical CMMI Adoption Roles

This section contains information and perspectives on people who use and commonly benefit from CMMI. Each of the roles are described along with their unique perspective, approach, and the benefits they realize leveraging CMMI. These are roles and not individuals or positions, and may be combined, split, or fulfilled differently in each organization.



Buyer

Buyer

Role Description

- The **Buyer** role includes senior management and those who control the budget, select, and manage solution suppliers, and hold approval authority for buying solutions for an organization. This role appreciates the business value that suppliers and vendors leveraging CMMI demonstrate through high quality delivery of products and services.

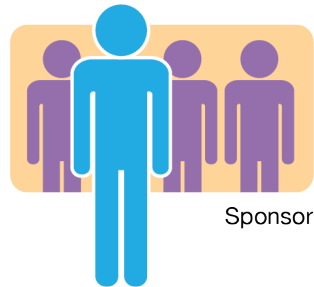
Role Activities

- Uses practices for supplier selection and management
- Understands the risk of doing business using suppliers and the risks each may bring
- Mitigates supplier risks
- Requires suppliers to adopt CMMI and understand what a supplier's CMMI capability, or maturity, means
- Uses CMMI practices to understand and address risk in the supply chain
- Evaluates risk and determines the quality required to rank incoming proposals to eliminate unsuitable bidders and select the supplier with the lowest risk
- Manages technical interactions
- Manages contractual issues on both sides
- Manages acceptance of deliverables
- Manages transitions of deliverables and solutions to operations
- Identifies and manages approaches to addressing security requirements
- Identifies and manages approaches to addressing safety requirements
- Establishes policy; provides budget and resources for remote workforce & virtual delivery

Benefits to Role

- Effectively and efficiently reduces risk to the buying organization
- Ensures that the highest quality suppliers are identified and selected, which meet knowledge, skills, and experience requirements

- Suppliers are managed throughout the solution period of performance
- Results in clear and unambiguous agreements
- Improves the interactions between suppliers and the buying organization
- Minimizes disputes
- Minimizes supply chain disruptions associated with safety and security issues



Sponsor

Role Description

- The **Sponsor** role includes senior management, including the “C-Suite,” e.g., Chief Executive Officer (CEO), Chief Operating Officer (COO), Chief Financial Officer (CFO), Chief Information Officer (CIO), but these roles are specific to those organizations adopting CMMI and conducting appraisals and other forms of assessments to determine their capability.

Role Activities

- Funds and oversees performance improvement initiatives
- Articulates the strategy and Business Objectives, including security and safety objectives
- Ensures alignment of strategy and Business Objectives
- Sets priorities for improvements, and verifies alignment with performance objectives
- Provides explicit requirements for senior management activities in supporting and sustaining improvement efforts
- Ensures that resources are available to implement the improvement efforts
- Approves appraisal objectives

Benefits to Role

- Enables process consistency across the organization
- Ensures the improvement effort supports achieving objectives
- Promotes a common understanding of the performance improvement objectives
- Fosters better coordination and communication among work groups
- Increases customer satisfaction
- Emphasizes and actively supports the importance of addressing security needs and requirements in the solution
- Reduces cost
- Monitors alignment and achievement of objectives
- Gains competitive advantage

- Attracts and retains top talent
- Positions organization for growth
- Reduces overhead cost
- Improves time to market
- Keeps current with market trends
- Uses integrated model to strengthen position in the market
- Increases growth and expands marketability
- Gets assurance of improvements
- Emphasizes and actively supports the importance of addressing safety needs and requirements in the solution
- Uses flexibility in model to meet organizational needs and reduce process overhead
- Improves workforce management
- Provides career path for developing the workforce
- Changes organizational behavior to better achieve strategy and Business Objectives
- Addresses and sells a wider set of capabilities because of the integrated model
- Provides a basis for tangible performance improvements, including safety and security considerations



Practitioner

Role Description

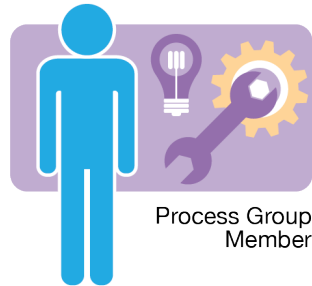
- The **Practitioner** role includes people in an organization who are following the processes and who get the most direct benefit from using and improving processes. It is crucial that these people are involved with the improvement activities, as they are the ones who must live with them every day.

Role Activities

- Follows the processes, and adheres to policies
- Provides feedback, inputs, and ideas for improving process and performance
- Participates in process groups, action teams, etc.

Benefits to Role

- Reduces rework
- Understands what is being done and why
- Provides structure for how work is done
- Stops reinventing the wheel
- Does the job better
- Minimizes overtime
- Shares best practices
- Reduces chaos and stress
- Gives a voice to practitioners in determining and making commitments
- Provides structure for defining explicit roles and responsibilities
- Ensures they have the skills and expertise needed to perform their roles and responsibilities
- Provides an environment conducive to increased performance
- Provides guidance for working together effectively and efficiently
- Provides guidance for navigating multiple priorities and reporting relationships
- Sustains existing expertise across the organization
- Increases individual competency growth
- Improves individual performance
- Participates in specific security awareness training
- Participates in specific safety awareness training



Process Group Member

Role Description

- The **Process Group Member** role includes the people assigned responsibility for improving and sustaining process and performance in the organization. The assignments can be full-time or part-time.

Role Activities

- Ensures improvement priorities and activities are aligned with improving performance and meeting business strategy and objectives
- Provides performance improvement guidance to promote understanding throughout the organization
- Coordinates and communicates improvement activities and benefits with stakeholders
- Solves organizational process and performance problems
- Assesses process capabilities and performance
- Identifies and provides needed improvements and training
- Identifies and addresses gaps in process implementation
- Uses source model disciplines in an integrated way
- Verifies process and performance integration, infrastructure, and alignment of results to Business Objectives

Benefits to Role

- Plans improvement efforts using a clear evolutionary path within Practice Areas
- Supports process persistence and sustainment with explicit infrastructure and governance
- Changes organizational behavior to better achieve strategy and Business Objectives
- Reduces the impact of process changes
- Establishes common process roles



Quality Manager

Role Description

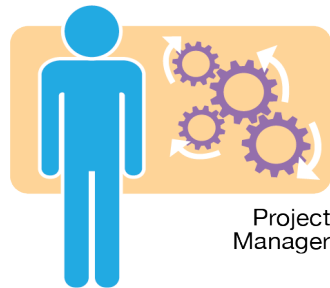
- The **Quality Manager** role includes individuals or groups whose main responsibility is for ensuring end-to-end holistic quality in the processes, their execution, and resulting solutions. This includes quality control, quality assurance, peer reviews, testing, verification and validation, and related activities.

Role Activities

- Identifies potential performance and process improvements
- Identifies security related quality issues
- Identifies safety related quality issues
- Provides guidance for determining if processes are being followed
- Helps identify if current processes support the existing work
- Supports providing management and stakeholders insight into process adoption and effectiveness
- Identifies non-compliance issues in process implementation
- Analyzes quality data to:
 - Identify patterns and trends
 - Anticipate problems and issues

Benefits to Role

- Maximizes quality of solutions
- Increases customer experience and satisfaction
- Enhances brand reputation
- Improves performance by avoiding non-valued-added activities
- Ensures processes work more effectively for practitioners and the organization
- Reduces rework
- Improves practitioner satisfaction and morale



Project Manager

Role Description

- The **Project Manager** role includes managers who are responsible for managing the day-to-day activities for producing and delivering solutions. This can include task, project, and program-level management roles. It also includes activities required to develop and sustain the skills and experience of the project team members to meet the current and future needs of the organization.

Role Activities

- Supports performance improvement activities
- Negotiates and confirms commitments
- Organizes teams and projects
- Reviews project and improvements
- Keeps senior management informed
- Enables communications throughout the organization
- Leverages the skills and experience of employees
- Provides guidance for effective career development, with alignment to needs of project and organization
- Encourages and enables active participation in improvement efforts
- Revises plans, schedules, budget, and resources as needed
- Integrates security and safety needs and approaches into plans
- Enables consistent employee evaluations, aligning compensation, rewards, and recognition with performance
- Enables empowerment of project team members
- Provides a framework for:
 - Establishing a productive work environment
 - Providing effective training and mentoring
 - Communication and coordination, including virtual considerations when appropriate

Benefits to Role

- Manages project to ensure solutions are on-time and within budget
- Provides oversight to ensure solutions meet identified requirements and meet or exceed performance expectations, including security and safety
- Enables effective allocation of resources, to support business strategies and objectives
- Reduces employee turnover and supports positive employee morale
- Increases clarity of assignments

- Minimizes non-value-added activities
- Ensures delivered solutions satisfy customer needs and expectations
- Ensures practitioners maintain their skillsets to support project and organization

Working with a CMMI Partner-Sponsored Individual

What is a CMMI Partner-Sponsored Individual?

CMMI Institute certifies individuals as CMMI Lead Appraisers to lead CMMI appraisals and certifies individuals as CMMI Instructors to teach official CMMI courses. These CMMI Instructors and CMMI Lead Appraisers may provide consulting services for organizations wanting to adopt CMMI. When working with one of these individuals, make sure that they work under the sponsorship of a CMMI Partner organization.

When acting as technical advisors, these experienced professionals work with clients to help them adopt CMMI to best meet their business needs and objectives. In some cases, this involves conducting a CMMI appraisal. Based on their experience in the industry and their quality record, these experts have been certified by CMMI Institute to deliver official training courses and appraisal services.

How to find a CMMI Partner-Sponsored Individual

CMMI Institute works with a network of licensed CMMI Partner organizations that employ certified individuals who are qualified to provide official courses and appraisals services. CMMI Partner-Sponsored Individuals can be found in the [CMMI Partner Directory](#). Additionally, CMMI Institute can provide services directly to your organization.

The CMMI Partner Network and certified individuals provide a vast, global reach to help to connect CMMI with users, managers, and executives who can benefit from CMMI solutions.

CMMI Institute and CMMI Partners are the only source for authentic CMMI services.

Consider needs and expectations when searching for and hiring a CMMI Partner. The CMMI Partner should be familiar with items such as:

- The type or domain of work performed by the organization, e.g., data, development, services
- The requirements of the methodologies used by the organization, e.g., Agile Development, DevSecOps, security, safety
- The scope of the implementation, e.g., large organization, small organization
- The industry, e.g., standards, best practices
- The applicable constraints, e.g., laws, regulations

An organization should ask the certified individual for references and examples of work that are similar to its needs, goals, and circumstances. [Figure 16. When and How a CMMI Partner-Sponsored Individual Can](#) Help provides a list of adoption steps and considerations for getting help from a CMMI Partner-Sponsored Individual.

Figure 16. When and How a CMMI Partner-Sponsored Individual Can Help

Adoption Steps	Considerations
LEARN: Learn how CMMI will benefit the organization.	A CMMI Partner-Sponsored Individual may help with: • Providing an overview of CMMI to the organization • Facilitating management buy-in. (Consider an external sponsored individual if management is more likely to listen to external expertise rather than internal.) • Answering questions about CMMI • Providing advice for starting improvement efforts • Assisting with proposal efforts
ESTABLISH OBJECTIVES: Develop and communicate business, performance, and improvement objectives.	An expert perspective may provide insights and valuable input for: • Identification of issues and needs • Definition of business, performance, and improvement objectives • Alignment of improvement efforts with needs and objectives
ANALYZE: Map current organizational processes to CMMI.	A CMMI Partner-Sponsored Individual may compare the organization's current processes to CMMI by: • Performing an independent gap analysis • Leading the organization's personnel in conducting a gap analysis or evaluation An external expert can add credibility to the delivery and acceptance of the analysis results.
DEVELOP ACTION PLAN: Develop, keep updated, and implement an improvement plan to get from the current state to the desired state.	A CMMI Partner-Sponsored Individual may be able to give management a better idea of what is needed for an improvement effort, including: • Resources • Activities • Schedule • Cost An expert may be able to assist in identifying appropriate measurements for addressing business, performance, and improvement objectives.
DEPLOY IMPROVEMENTS: Deploy improvements.	The continued assistance of a CMMI Partner-Sponsored Individual can help provide knowledge and expertise to help an organization efficiently deploy improvements and monitor adoption.
ASSESS CAPABILITY: Assess organizational capabilities.	A CMMI Partner-Sponsored Individual may help an organization: • Monitor improvement efforts and performance targets • Help adjust the improvement plan • Plan for formal CMMI Appraisals, if needed

Adoption Steps	Considerations
	To be formally appraised, the organization needs to choose a Certified CMMI Lead Appraiser working under the sponsorship of a CMMI Partner. The Lead Appraiser can help with: • Identifying the organizational and model scope • Selecting and training Appraisal Team Members • Planning the appraisal activities

Working with CMMI Institute

CMMI Institute is trusted by thousands of high-performing companies worldwide to deliver guidance to build and sustain processes that drive business value and innovation. CMMI (Capability Maturity Model Integration) is a globally recognized performance improvement framework that helps organizations elevate and benchmark their capabilities to deliver high-quality products and services. Backed by decades of proven results, CMMI empowers organizations across industries to achieve measurable outcomes in quality, productivity, and efficiency. Designed with an open architecture, CMMI adapts to emerging challenges and industry-specific needs—enabling the development of tailored extensions like the Medical Device Discovery Appraisal Program (MDDAP), which supports FDA’s Case for Quality initiative. To learn more about CMMI, visit the CMMI Institute Website.

The Role of CMMI Institute

CMMI Institute is the owner and steward of the CMMI Performance Solutions ecosystem; including the model, appraisal method, courses, certifications, systems, and associated intellectual property.

When to Use CMMI Institute

An organization can contact CMMI Institute by visiting Customer Support, which provides general help information and the ability to submit a support request. CMMI Institute can assist through their Customer Success team as an organization adopts CMMI. When new methods, approaches, or other content are identified for potential inclusion in future model updates, CMMI Institute maintains the requirements, updates, and release plans and schedule for the CMMI Performance Solutions ecosystem.

Generally, CMMI Institute points you to experienced CMMI Partner-Sponsored Individuals available through the CMMI Partner Network. However, in limited situations, CMMI Institute may work directly with organizations to provide support to:

- Corporate programs for large organizations looking to develop an enterprise-wide improvement program
- Organizations wanting to build internal CMMI subject matter expertise and consulting
- Industry programs for trade associations or government agencies that want to build a strategy for improving performance across an industry

- Organizations interested in piloting new content, methods, or approaches for CMMI

If this describes your organization's goals or if you have any questions about how to engage CMMI Institute directly, contact CMMI Institute at <https://support.isaca.org/s/>.

Appendix E: Building Goals, Risks, and KPIs

To improve your organization's performance, you must first understand your business goals along with your ability to meet those goals. This information can also be recorded using the Performance Report template that a Certified CMMI Lead Appraiser uses as a part of appraisal activities.

- List the top 3-5 business goals for your organization:
 - 1.
 - 2.
 - 3.
 - 4.
 - 5.
- List the top 3-5 Key Performance Indicators (KPIs) for your organization:
 - 1.
 - 2.
 - 3.
 - 4.
 - 5.
- Quantify your current performance (list your current KPIs):
 - 1.
 - 2.
 - 3.
 - 4.
 - 5.
- List the issues or risks impacting your ability to meet your business goals:
 - 1.
 - 2.
 - 3.
 - 4.
 - 5.

Appendix F: Define Your Current Processes

WHY (What, How, Your CMMI)

What do you do today? List the tasks associated with current activities.

- Work, program, project, and task management
 - Identify the activities, e.g., planning, staffing, scheduling, estimating
- Designing, developing, building, and delivering a service or product
 - Identify the activities, e.g., recording what the customer wants (identifying the “requirements”), elaborating these requirements to determine how the customer’s needs are met, designing the service or product, building the service or product, testing the service or product to determine if it meets the needs of the customers, deliver the service or product
- Collateral activities associated with service or production
 - Identify the activities, e.g., ensure consistent delivery of service or product (configuration management), ensure consistent and repeatable performance of building service or product (quality), measure activities associated with the production and delivery of service or product, identify risks associated with service or product production
- Organizational support and infrastructure
 - Identify the activities the organization performs to enable quality and consistent services and products, e.g., record practices and processes to be used across all services and products, and training associated with enabling the workforce to perform their tasks

How do you perform these tasks? After the required activities are identified, elaborate each activity with “how” you perform the activities – the “how” can be bullets, checklists, documents. The formality of the “how” can be determined by your organization.

Your CMMI: Use this list of activities and their associated elaborations and map them to the activities your organization will perform within the context of CMMI, using the view of CMMI that most applies to your organization and its capability and performance goals.

Appendix G: CMMI Practice Area Security Adoption Examples

Figure 17. [CMMI Practice Area Security Adoption Examples](#) includes *examples* of security relationships and impacts.

This is not a comprehensive list of all possibilities.

Figure 17. CMMI Practice Area Security Adoption Examples

Practice Area	Description of Example Security Relationships	Security Relationship Details	Potential Impacts of Not Addressing
Category: DOING			
Capability Area: Delivery & Managing Services (DMS)			
Service Delivery Management (SDM)	In planning for services to be offered by an organization, the ability to ensure customer security is essential. Often services involve the collection of customer data. This data is provided assuming the data is shared only through authorized access anchored in principles of least privilege and need to know. Security requirements, including physical security requirements, associated with the service delivery should be an integral part of the service objectives, approach, and incorporated within the service system. The organization's security approach and security controls are critical to the organization's reputation within the industry and with their customers.	- Data under consideration may include: personnel information, financial information, competition sensitive information, and proprietary data. These are just a few data types and content that can be considered a threat if compromised. - Work should be performed offline to the extent possible to avoid internet compromises - Access controls and multi-factor authentication parameters should be defined and implemented - Physical security parameters should be established to	- Service organization reputation could be harmed - Personnel data leaks could result in identity theft - Proprietary or competition sensitive data leaks could cause loss of business
Strategic Service Management (STSM)			

Practice Area	Description of Example Security Relationships	Security Relationship Details	Potential Impacts of Not Addressing
		ensure secure service delivery	
Capability Area: Engineering & Developing Products (EDP)			
Product Integration (PI)	While developing functional solutions for products, security threats and vulnerabilities must be anticipated. The results of these occurring should be analyzed to ensure that the product design minimizes or avoids their occurrence. In order to account for the security requirements and vulnerabilities that are not known, the use of exception handling is utilized to respond to the occurrence of exceptions – anomalous or exceptional conditions requiring special processing – during the execution of a program. If they do occur, disruptions should be minimized and analyzed to determine what the tolerance of acceptance is for the product. When integrating the system components, security threats should be tested for their disruption and effect, in addition to testing for security requirements.	• New threats are continually being identified, and product design should focus on anticipating new threats before they become an issue. It is recommended to designate a specific individual or group in charge of tracking the various government security related regulations, standards, and laws, and researching the latest vulnerabilities. • Periodically remind individuals, e.g., requirements analysts and testers, to watch for abnormalities • Ensure the design incorporates consideration of known security threats • Concepts associated with defense in depth should be considered • Have backup plans, e.g., shut down when a new threat	• System could be disabled • Unplanned reduced capabilities might occur • Total crashing of the system, preventing business operations might happen • Revenue could be lost
Technical Solution (TS)			

Practice Area	Description of Example Security Relationships	Security Relationship Details	Potential Impacts of Not Addressing
		is recognized, revert to alternative code Establish mechanisms for frequent system backups, including when data should be stored off site	
Capability Area: Ensuring Quality (ENQ)			
Peer Reviews (PR)	Security is NOT an afterthought. It is critical that it is included in all activities associated with the development of a product or service. Security requirements should be integrated into the functional requirements for both products and services. Their prioritization and assignment to components is coordinated with other requirements. Security requirements, attributes, and controls should be included in peer reviews during the planning and development of the product or service. Peer review checklists should include security as part of the normal verification activity. The security attributes and controls should be verified and validated throughout the lifecycle. Quality activities that are prescribed during the lifecycle should include security not as an extension but as a vital	- Security and access rights may affect who can review documents, audit processes, or test functionality. Ensure all personnel involved with these activities have relevant clearances or access rights. - Requirements should include strong authentication requirements, e.g., multi-factor authentication - Requirements should also include any external regulatory security requirements that have been imposed by the country or customer - Quality should also audit for regulatory compliance throughout the lifecycle of the product or service. Audits should be	- System or data breach could happen - Data could be lost or compromised - Sensitive data could be disclosed - Jobs could be lost because of a violation of the regulations - Fines could be imposed due to violations of regulations - Plant could be shut down when regulations result in remediation - Work may be delayed or prevented if clearances or access rights are not in place
Process Quality Assurance (PQA)			
Requirements Development and Management (RDM)			
Verification and Validation (VV)			

Practice Area	Description of Example Security Relationships	Security Relationship Details	Potential Impacts of Not Addressing
	part of the functionality of the product or service. Quality checklists should include security within the normal audits.	periodic and event driven.	
Capability Area: Selecting & Managing Suppliers (SMS)			
Supplier Agreement Management (SAM)	When suppliers are selected and supplier agreements are made, security should be a factor. Security requirements should be allocated as appropriate to all suppliers. Security controls within the functional solution are often further projected into functional components and these are often out of the direct control of the provider. The requirements are allocated to components and likewise to the organizations responsible for the production of individual components or the organization responsible for the service. The supplier must assume responsibility for supplier associated security responsibilities.	- Suppliers should be assigned end item responsibilities for security compliance for each delivered product or service - Supplier should be required to demonstrate compliance to any product or service security regulation - Before the organization accepts a supplier deliverable, they should ensure regulatory compliance, error exception handling, and operational continuity after a threat or vulnerability is detected, and backup capabilities (if needed)	- Organization's reputation could be damaged since supplier is working under the organization's direction - System shutdown or service stoppage could occur - Loss of revenue
Category: MANAGING			
Capability Area: Managing Business Resilience (MBR)			
Continuity (CONT)	It is important to consider that regardless of how robust the system is, security threats and	Comprehensive continuity planning is necessary to manage all possible	Sudden unpredicted system/service
Incident Resolution and			

Practice Area	Description of Example Security Relationships	Security Relationship Details	Potential Impacts of Not Addressing
Prevention (IRP)	vulnerabilities may still occur. Many threats and vulnerabilities are unknown and will continue to evolve throughout the lifespan of the system or service. Monitoring the system for vulnerabilities is a non-ending activity. When vulnerabilities are first identified, they are considered as risks. They are prioritized and analyzed for probability of occurrence. Plans for acceptance or mitigations can be put in place. Part of that plan should be planning for an actual threat or vulnerability disrupting business. A full business continuity plan addressing the business operations after a disruption should be developed and this plan should be dry run to ensure all responsibilities are covered and business is restored. Incidents such as threats and vulnerabilities should be solved, and it is important to prioritize and prevent these occurrences from recurring. Prevention activities also include preparing for and avoiding possible future unknown incidents.	disruptions to the business	shutdown might occur
Risk and Opportunity Management (RSK)		- Threats and vulnerabilities are continuously evolving. New ones continue to be identified. It is important to predict as much as possible incidents and risks that can occur and how they can be handled. - Hacking into your system might happen; it is important to know when to shut down - Phishing emails could be sent to you; educating the operators is critical - Additionally, part of this handling can be the determination of the results from realizing the threat and what the system/service can tolerate, when to shut down - Incident response teams are often defined and trained, so they can react and manage incidents that affect the system when they occur	There could be a long period of time without recovery. Customers left without system or service for an undetermined amount of time.

Practice Area	Description of Example Security Relationships	Security Relationship Details	Potential Impacts of Not Addressing
Capability Area: Managing the Workforce (MWF)			
Organizational Training (OT)	Training associated with security should include internal and external security approaches, objectives, and controls. The organization itself will have a significant amount of data that cannot risk being compromised. This data includes personnel data, competition sensitive data, and customer specific data. All personnel should be trained in the protection of this data and their individual responsibilities in the protection of that data. Security attributes should also be included in the product and service development lifecycle. As far as virtual delivery, since this assumes communication over very often non-secure communication lines, personnel should understand what can be shared across these lines, how to handle conversations on these lines, and other restrictions.	• Security training is varied and dependent on the individual roles and responsibilities • The entire organization should take security awareness and education training. This should include how to address suspicious emails, customer/supplier access to company data, password protection, visitor logs, badge entry, company sensitive versus public information, implications of regulatory requirements etc. • Product and service developers should be trained in how to incorporate security into functional solutions • Business Objectives should incorporate security goals. These should be communicated throughout the organization. • Virtual training should include access to virtual meetings, e.g., passwords are	• Inappropriate access to sensitive information from outside (hackers) • Lack of trained personnel may lead to unintentional vulnerabilities • Personnel not aware of or properly following physical security protocols can lead to unauthorized visitor access, which can result in theft of physical or intellectual property • Inappropriate access to virtual meetings enables outsiders to gain access to competitive or internally sensitive information
Enabling Virtual Work (EVW)			
Workforce Empowerment (WE)			

Practice Area	Description of Example Security Relationships	Security Relationship Details	Potential Impacts of Not Addressing
		typical for access to virtual lobbies	
Capability Area: Planning & Managing Work (PMW)			
Estimating (EST)	Planning for product development and service delivery includes the incorporation of security in all aspects of the lifecycle. Estimating security assumes the same diligence of all other requirements. They should be planned for at the inception of the job and monitored through the production cycle. Data on the planning should be kept ensuring security estimates in the future are based on real organizational experience.	- Quality estimates on additional security regulatory audits must be considered and incorporated - Estimates for product and service tests associated with security requirements and associated planning must also be considered and incorporated - Security requirements should also be estimated and planned when accepting supplier components - The size, frequency, timing, and nature of specific security activities should be estimated and planned to ensure that personnel with the necessary clearances, access rights, knowledge and skills are in position to perform their duties at the appropriate time. This may include service delivery tasks or product development tasks that necessitate	If security is not planned for the product or service, security issues may be discovered too late and therefore more costly to fix
Planning (PLAN)			
Monitor and Control (MC)			

Practice Area	Description of Example Security Relationships	Security Relationship Details	Potential Impacts of Not Addressing
		access to sensitive or security restricted information.	
Category: ENABLING			
Capability Area: Managing Data (MD)			
Data Management (DM)	A data security approach should include defined data needs, data criticality, and identified required compliance with appropriate laws and regulations. It is essential that an organization plans for data resiliency so it can recover from any type of business disruptions or cyber attacks.	• Data related to personal identifiable information (PII) or personal health information (PHI) must be secure and comply with laws and regulations. • Administrative control using the principle of "least privilege access," restricting or limiting authorized users • Access controls need to be put in place to protect data such as encryption, data masking, redaction of sensitive information	• Unauthorized access to data or a data breach • Loss of trade secrets or intellectual property (IP) • Noncompliance with regulatory requirements, which could result in fines • Loss of confidence from users and/or consumers if data is not protected
Data Quality (DQ)			
Capability Area: Supporting Implementation (SI)			
Causal Analysis and Resolution (CAR)	Security issues will occur. These will be both disruptive and may impact more than initially anticipated. Those outcomes which should never be repeated should be analyzed using traditional root cause analysis to avoid their reoccurrence. Likewise, if a security outcome is	• When a security event causes system or service disruption, it is critical that an appropriate analysis be performed to avoid recurrence • Other security outcomes like data breaches and physical theft may	• Threats may continue if root causes of vulnerabilities are not addressed • New product or service development will not have opportunity for good

Practice Area	Description of Example Security Relationships	Security Relationship Details	Potential Impacts of Not Addressing
	particularly effective, it should be analyzed to promote further use.	also warrant further analysis before ensuring that the occurrence will not recur	estimating and planning without insights from previous initiatives
Configuration Management (CM)	Work products associated with security (e.g., requirements, objectives, approaches) should be identified for configuration management. The same rigor associated with development and service work products should be applied.	Work products like security event root cause analysis, security training, security strategies, security approaches for products and services, and security plans should be included in the organization configuration management data	Without alternative solutions, a determination of the right solution is hampered. If there are issues with the solution, it would be difficult and often costly to restart with an evaluation of alternatives.
Decision Analysis and Resolution (DAR)	As the security requirements are finalized and the lifecycle progresses to determine a viable security approach and system, alternative solutions may be identified. These alternative solutions are prioritized and categorized to make the best selection. In product or service system development, security considerations should be a high priority in the determination of the appropriate technical solution.	When determining a security solution for functional solutions, alternatives like multi-factor authentication, varying levels of security for data, and system privileges should be considered	
Capability Area: Managing Security & Safety (MSS)			
Enabling Security (ESEC)	This Capability Area is dedicated to Safety and Security. For security this establishes the organizational security strategy, security approach, and security objectives. It is important to note that this security	The security strategy and safety strategy determine the momentum and commitment of the organization to the importance of security and safety,	If security and safety are put at an auxiliary or support level versus a primary initiative, this can cause the impacts of
Enabling Safety (ESAF)			
Managing Security Threats and			

Practice Area	Description of Example Security Relationships	Security Relationship Details	Potential Impacts of Not Addressing
Vulnerabilities (MST)	approach incorporates any security framework or security regulations that may be required for the organization. This area also confirms that security threats and vulnerabilities are given additional focus beyond risks or incidents. It specifically looks at security risks and security incidents as threats and vulnerabilities. It raises the importance of ensuring that the attention to threats and vulnerabilities are managed. The organization also determines their tolerance for accepting the possible disruptions. For safety, similarly to security, this area establishes the organization's safety strategy, safety approach, and safety objectives.	both internally and externally • The security approach and likewise the safety approach determines roles and responsibilities, how the organization implements the security strategy, and safety strategy respectively • Managing the security threats and vulnerabilities enhances the organization's existing risk and opportunity management system by establishing threats and vulnerabilities with the critical visibility they need • Managing threats that are in a constant evolution is a challenge and clearly goes beyond the constraints of a risk	security threats and safety hazards to be more impacting and recovery less structured. It can take longer for the organization to recover and proceed operationally.
Category: IMPROVING			
Capability Area: Improving Performance (IMP)			
Managing Performance and Measurement (MPM)	The organizational security strategy should be integrated into all operations of the organization. The process	• When recording policies and procedures, concepts associated with defense in	• Central focus on security is missing • Repeating security

Practice Area	Description of Example Security Relationships	Security Relationship Details	Potential Impacts of Not Addressing
Process Asset Development (PAD)	assets should include security specific policies, procedures, work instructions, while existing operational process assets should include security considerations and requirements. Improvement activities should include those specific to security, and for any improvement identified, security needs and requirements must also be addressed. Security metrics should be incorporated within the organizational measurement repository. The metrics should be at the organization as well as the product and service levels. These metrics should be collected, reviewed, analyzed, and stored.	depth, defining multiple layers of security controls, should be understood • Policies and procedures with common approaches for security should be established • Tailoring guidance should be available on those aspects that may be security dependent for customers and contracts • Security metrics should include security threat and vulnerabilities, e.g., metrics on time to resolve, compliance metrics associated with audits, disruption metrics - time to return to full operability, continuity plan dry run metrics.	approaches independently for every product and service is ineffective • Risk of missing a threat or vulnerability that is already known
Process Management (PCM)			
Capability Area: Sustaining Habit & Persistence (SHP)			
Governance (GOV)	Any process strategy needs top-down support and an organizational structure to enable and support its deployment. Senior management must ensure that the overall Business Objectives include the security strategy and approach. Business Objectives may	• Business Objectives including management commitment to security are important • Goals associated with security specific and measurable security	• Lack of a focused approach to security, which includes the necessary resources and budget and is driven by senior management,
Implementation Infrastructure (II)			

Practice Area	Description of Example Security Relationships	Security Relationship Details	Potential Impacts of Not Addressing
	enable derived security objectives to align the organization with its regulations and security frameworks. Also, the organization must provide the time, budget, education, tools, and people needed to accomplish security requirements, approaches, and meet security expectations.	initiatives must be included • Security training is critical • Universal knowledge of security and its role in the organization is key for everyone • Top-down approach to security, e.g., policies driven and reinforced by senior management, are instrumental to laying the foundation for security within the organization	can be detrimental to the longevity of the organization, through a negative reputation or the inability to keep systems and services available

Appendix H: Performance Categories

[Figure 18. Performance Report Measurement Categories and Related Subcategories](#) include *examples* of security relationships and impacts. The Performance Report is an important aspect of the CMMI® appraisal process. It places emphasis on the performance improvements that come from adopting a CMMI-based performance improvement approach. The report enables an appraisal team to provide valuable information to the Appraisal Sponsor and the organization about their performance as compared to their stated objectives. The appraisal team uses the organization's own performance data to provide feedback to the Appraisal Sponsor and the rest of the organization.

It is important for an organization to consider what they want to measure, why they are measuring it, and how it will help the organization meet its Business Objectives. The performance report summary is based on the categories and subcategories below in [Figure 18. Performance Report Measurement Categories and Related Subcategories](#). Consider the categories and subcategories listed below for your improvement efforts.

Figure 18. Performance Report Measurement Categories and Related Subcategories

Definitions			
Category	Definition	Related Subcategories	Description
Financial Performance	Financial management, revenue, and profitability targets.	Budget Related	Budgeting activities.
		Cost Management	Actual costs compared to estimated or budgeted costs or general costs related objectives or reductions.
		Cost Variance	Difference in estimated or planned and actual costs.
		Effort Variance	Difference between a planned and actual effort for various phases within the project.
		Finance	General finance related measure, not reflected in other subcategories.
		First Time Right	Process is followed and resulting solution is correct the first time and every time.
		Gross Revenue Growth	Amount of income made over time.
		Margins	The degree to which a business activity makes money.
		Market Growth	Change in market share.

Definitions			
Category	Definition	Related Subcategories	Description
		Net Income Growth	How much net income has increased over a period.
		On Time Payment or Invoicing	Payments or invoices sent or received on time.
		Sales Growth	Increase in sales compared to the previous period.
Operational Performance	Measures how well a company performs its core business activities.	Contract Compliance	Monitoring and controlling the procedures and norms outlined by a contract with another entity.
		Customer Satisfaction	General customer satisfaction and expectations related measures, not reflected by other subcategories.
		Operational Activities	General operational efficiencies and activities, not reflected by other subcategories.
		Risk Management	Identification and management of various types of risks and opportunities.
		Service Level Agreement	A documented agreement between a service provider and a customer that specifies the measured level of service the customer expects.
Process Performance	An indication of activities based on standard procedures.	Process	General process related measures, not reflected by other subcategories.
		Process Compliance	Objective evaluation of process performance and outcomes including resolving issues, non-compliances, or to meet regulatory requirements.
		Process Cycle Time	The total time it takes to complete a process or subprocess from start to finish.
		Process Improvement	Measures of improving solutions or processes.
Productivity Performance	An evaluation of resource efficiency for	Code Coverage	Amount of all code covered by test cases including manual and automated.

Definitions			
Category	Definition	Related Subcategories	Description
	delivering solutions.	Defect Removal Efficiency	Measure of the ability to remove defects prior to release.
		Development Productivity	Ability to efficiently create software during a specific period.
		Peer Review Efficiency	Defects detected compared to time spent.
		Productivity	General productivity related measure or objective, not reflected by other subcategories.
		Project or Solution Productivity	Amount of work completed per unit time used or per unit resource assigned.
		Resource Utilization	Measures the actual usage or consumption of resources in relation to their availability.
		Reuse Rate	Existing software, hardware, or other materials or resources reused for new solutions.
		Rework	Time or effort spent making changes to the prior version because of issues.
		Solution Availability	Duration of time the solution is available for use.
		Sprint Efficiency	Work completed versus work committed per sprint.
		Testing Productivity	Ability to effectively perform testing activities in a specific period.
		Velocity	Amount of work completed in a given iteration.
		Workload Variance	Difference between estimated or planned, and actual workload.
Quality Performance	Delivered solution performs as expected.	Data Quality	General data quality related measure or objective.
		Defect Containment	Measure of the ability to minimize defects that escape to downstream activities.

Definitions			
Category	Definition	Related Subcategories	Description
		Defect Density	Measures the number of defects per unit of output.
		Defect Detection	Rate defects are discovered.
		Defect Injection Rate	Rate defects are introduced into a solution.
		Delivered Solution Quality	Ability to design, develop, validate, and deploy solutions that effectively address requirements.
		Mean Time Between Failures	A measure of system or component reliability.
		Quality	General quality related measure, not reflected by other subcategories.
Safety Management	Prevention and control of harm.	Lost Time Injury	Amount of productive work time lost as a result of injuries sustained on the job.
		Safety Activities	General safety related activities, not reflected by other subcategories.
		Safety Incidents	Number of unplanned safety impacting events resulting in injury, damage, or disruption to normal operations.
		Safety Violations	Number of violations of safety policies or procedures.
Security Management	Systematic identification, assessment, control, and resolution of security needs and threats.	Devices Running Unauthorized Software	Devices running unsanctioned software.
		Mean Time to Contain (MTTC)	Average time to secure all compromised endpoints and attack vectors.
		Mean Time to Detect (MTTD)	Average time between when an incident occurs and it is detected.
		Mean Time to Response (MTTR)	Average time to neutralize a threat and regain control of compromised systems.
		Privileged Account Access	Number of users with privileged account access.

Definitions			
Category	Definition	Related Subcategories	Description
		Recovery Point	Measure of how much data lost after a disruption before it exceeds an organization's acceptable level.
		Recovery Time	The duration it takes for an organization to restore full operations after an incident.
		Security	General security related measures or controls, not reflected by other subcategories.
		Security Incidents	Occurrence of security related events.
		Security Patch Management	Time from when the patch is available until it is deployed in production.
		Security Training Coverage	Measure of personnel compliance with current security training.
Supplier Performance	Supply chain management activities.	Supply Chain Activities	General supply chain measures, not reflected by other subcategories.
		Supplier Defect Containment	Measure of the ability to minimize supplier defects that escape to downstream activities.
		Supplier Defect Density	Defects delivered in a supplier solution.
		Supplier Peer Reviews	Review of a project's artifacts including documentation, requirements, code, design, test cases, etc.
		Supplier Peer Review Efficiency	Supplier defects detected compared to time spent.
		Supplier Quality	Supplier's ability to deliver goods or services that satisfy customers' needs.
		Supplier Test Coverage	Measurement used to describe the degree to which the supplier source code or requirements of a solution are verified by test cases.

Definitions			
Category	Definition	Related Subcategories	Description
		Supplier Testing Effectiveness	Supplier defects detected during a testing period.
Technical Performance	Activities related to the creation, delivery, or performance of solutions.	On Time Delivery	Measure of target dates achieved.
		Requirements Achievement	General functionality related measure or number of requirements completed.
		Requirements Volatility	Percent requirements change from their baselined state.
		Schedule Activities	General schedule related measure or objective.
		Schedule Performance Index	An earned value measure of the actual versus planned progress.
		Schedule Variance	Measures the difference between the planned and actual progress achieved at a specific point in time.
		Technical Activities	General technical related activities, not reflected by other subcategories.
		Test Automation	Extent to which automated tests cover different aspects of the solution.
		Test Coverage	Measurement used to describe the degree to which the source code or requirements of a solution are tested by test cases.
		Testing Effectiveness	Defects detected during a testing period.
Workforce Management	Having the right human resources with the needed knowledge, skills, and capacity to deliver the organization's solutions.	Diversity, Equity, and Inclusion	Tracking of organization Diversity, Equity, and Inclusion (DEI) efforts based on DEI goals, initiatives, or targets.
		Employee Attendance	Amount of time employees are absent from work.
		Employee Retention	Measures the number of employees who remain employed at an organization over a specific period.

Definitions			
Category	Definition	Related Subcategories	Description
		Employee Satisfaction	Level of contentment of an organization's employees.
		Headcount	Total number of employees.
		Key Employee Turnover	Turnover rate in key positions in the organization.
		Length of Service	Duration of time an individual has worked in a position or for a particular employer.
		Organizational Development	Organization wide activity to increase effectiveness and culture.
		Staff Development	Activities to increase workforce knowledge, skills, capacity, and readiness to deliver solutions.
		Time to Fill	Time to find and hire a new candidate into the role.
		Time to Proficiency	Amount of time it takes for an employee to acquire the necessary skills and knowledge to perform a job at an acceptable level.
		Virtual or Hybrid Workforce	Measure of the workforce that includes use of virtual, remote, or hybrid methods to manage personnel, work efforts, communication, and collaboration.
		Workforce Activities	General workforce related activities, not reflected by other subcategories.
		Workforce Opportunity Costs	Potential benefits a company or individual loses when choosing one workforce related course of action over another.

Appendix I: Context Specific Tags

Within in CMMI, there are two types of informative material: “explanatory” and “context specific.” The “**Context Specific**” section contains information that is relevant to a context and establishes common ground for a specific industry, methodology, or discipline. The context specific information mirrors the structure of the required and explanatory information, including links to additional informative material. It includes the:

- Context specific identifier and description
- Context specific explanation
- Intent and value of the context specific information as it relates to the practice, as needed
- Example activities in addition to those listed in the explanatory information material, as needed
- Context specific work product examples and definitions, attributes, or type of things to include in the work product content in this context, as needed
- External links or information, e.g., training, templates, example assets

Examples of contexts may include:

- Agile Development
- Artificial Intelligence
- Data
- Development
- DevSecOps
- People
- Safety
- Security
- Services
- Suppliers
- Virtual

[Figure 19. CMMI Context](#) Specific Tags references all locations of all the context specific tags in CMMI. Reviewing the context specific information can help for adoption for organizations in specific industries or that use specific methodologies or disciplines.

Figure 19. CMMI Context Specific Tags

Context Specific Tag	Practice Area/Practice		
Agile Development	- CAR PA - CM PA - DAR PA - EST PA - MPM PA - MC PA	- PR PA - PLAN PA - PLAN 2.1 - PAD PA - PCM PA - PQA PA	- PI PA - RDM PA - RSK PA - TS PA - VV PA
Artificial Intelligence	- CAR PA - CAR 2.1 - CAR 2.2 - CAR 3.1 - CAR 3.2 - CAR 3.3 - CAR 3.4 - CAR 3.5 - CAR 4.2 - CAR 5.1 - CM PA - CM 2.1 - CM 2.2 - CM 2.3 - CM 2.4 - CM 2.6 - CONT PA - DM PA - DM 1.2 - DM 2.1 - DM 2.2 - DM 3.1 - DM 3.2 - DQ PA - DQ 2.2 - DQ 2.3 - DQ 3.1 - DQ 3.2 - DAR PA - DAR 2.1 - DAR 2.2 - DAR 3.1 - ESAF PA - ESAF 2.1 - ESAF 2.2 - ESAF 2.3 - ESAF 3.3 - ESEC PA - ESEC 2.1	- II 4.1 - IRP PA - IRP 2.1 - MPM PA - MPM 2.1 - MPM 2.2 - MPM 2.4 - MPM 2.6 - MPM 3.2 - MPM 4.1 - MPM 4.4 - MPM 4.5 - MST PA - MST 2.1 - MST 4.1 - MC PA - MC 2.4 - MC 3.1 - MC 3.3 - OT PA - OT 2.1 - OT 3.1 - PR PA - PR 2.2 - PR 2.3 - PR 2.4 - PR 3.1 - PLAN PA - PLAN 2.1 - PLAN 2.2 - PLAN 2.3 - PLAN 2.4 - PLAN 3.1 - PLAN 3.3 - PLAN 3.4 - PLAN 4.1 - PAD PA - PAD 2.1 - PAD 2.2	- PQA 2.2 - PQA 2.3 - PQA 3.1 - PI PA - PI 2.1 - PI 2.2 - PI 2.3 - PI 3.1 - RDM PA - RDM 2.1 - RDM 2.2 - RDM 2.3 - RDM 2.4 - RDM 3.1 - RDM 3.2 - RDM 3.5 - RDM 3.6 - RDM 3.7 - RSK PA - RSK 2.1 - RSK 3.1 - RSK 3.2 - RSK 3.3 - RSK 3.4 - SDM PA - SDM 2.1 - SDM 2.4 - SDM 2.5 - SDM 2.6 - STSM PA - SAM PA - SAM 2.1 - SAM 2.3 - SAM 3.2 - TS PA - TS 2.1 - TS 2.2 - TS 2.3 - TS 3.1

Context Specific Tag	Practice Area/Practice		
	- ESEC 2.3 - ESEC 2.4 - ESEC 3.1 - ESEC 3.2 - EVW PA - EST PA - GOV PA - GOV 2.1 - GOV 2.2 - GOV 2.4 - GOV 3.1 - GOV 3.2 - GOV 4.1 - II PA - II 2.1 - II 3.2 - II 3.3	- PAD 2.3 - PAD 3.1 - PAD 3.2 - PAD 3.3 - PAD 3.5 - PAD 3.6 - PCM PA - PCM 2.1 - PCM 2.2 - PCM 3.1 - PCM 3.2 - PCM 3.3 - PCM 3.4 - PCM 3.6 - PCM 4.1 - PQA PA - PQA 2.1	- TS 3.2 - TS 3.3 - TS 3.5 - TS 3.6 - VV PA - VV 2.1 - VV 2.2 - VV 2.3 - VV 3.1 - VV 3.2 - WE PA - WE 2.1 - WE 2.2 - WE 2.3 - WE 3.1 - WE 3.3
Data	- CM 2.5 - ESEC PA - GOV PA - II PA - II 2.2 - MPM PA - MPM 4.1	- MC PA - OT PA - OT 3.4 - PLAN PA - PLAN 2.7 - PAD PA - PQA 2.2	- PI PA - RDM PA - RDM 2.2 - SAM 2.1 - TS PA - TS 3.1
Development	- CM PA - CM 2.3 - DAR PA - DAR 2.1 - MPM 4.1 - MST PA	- PLAN PA - PLAN 2.1 - PLAN 2.8 - PLAN 3.2 - PLAN 3.4	- RDM PA - RDM 3.1 - RDM 3.4 - SAM 3.1 - VV 2.1
DevSecOps	- CAR PA - CAR 2.1 - CM PA - CM 2.2 - CM 2.3 - ESEC PA - ESEC 3.2 - ESEC 3.3 - EVW PA - II PA - II 2.1 - II 2.2	- MPM PA - MPM 2.2 - MC PA - OT 3.4 - PR PA - PR 2.1 - PR 2.2 - PR 2.3 - PR 3.1 - PLAN PA - PAD PA - PAD 3.2	- PAD 3.3 - PI PA - PI 2.1 - PI 2.2 - PI 2.3 - PI 2.4 - PI 2.5 - PI 2.6 - PI 3.1 - PI 3.2 - PI 3.3 - TS PA
People	- EST PA - GOV PA - II 3.1	- MPM 2.1 - MPM 2.2	- OT 3.2 - PLAN PA
Safety	- CM 2.1 - CONT PA - GOV PA	- OT 3.4 - PLAN PA - PAD PA	- RDM 2.3 - RDM 2.4 - RSK 3.2

Context Specific Tag	Practice Area/Practice		
	• II PA • II 3.3 • IRP PA • MPM PA • MPM 2.1 • OT 2.1	• PAD 3.2 • PAD 3.3 • PQA 2.2 • RDM 2.1 • RDM 2.2	• RSK 3.4 • SAM 2.4 • TS PA • TS 2.1 • VV PA
Security	• CM 2.1 • GOV PA • GOV 2.1 • II PA • II 3.3 • IRP 2.1 • MPM PA • MPM 2.1 • MPM 2.2 • MPM 2.3 • OT PA • OT 2.1	• OT 3.4 • PLAN PA • PLAN 2.1 • PLAN 2.4 • PLAN 2.5 • PLAN 3.4 • PAD PA • PAD 3.2 • PAD 3.3 • PQA 2.2 • PI 2.1 • RDM PA	• RSK 3.1 • SAM PA • SAM 2.2 • SAM 2.3 • SAM 2.4 • TS PA • TS 2.1 • TS 2.3 • TS 3.1 • TS 3.2 • VV PA
Services	• CAR PA • CM PA • CM 2.2 • DAR 2.1 • EST 2.2 • EST 2.3 • II 2.2 • MPM 2.1 • MPM 2.2 • MPM 3.5 • MST PA • MC PA • MC 2.1	• MC 2.2 • MC 2.4 • MC 3.1 • OT PA • PLAN PA • PLAN 1.1 • PLAN 2.1 • PLAN 2.2 • PLAN 2.3 • PLAN 2.4 • PLAN 3.1 • PLAN 3.2 • PLAN 3.4	• PAD 3.4 • PI PA • PI 3.1 • PI 3.2 • PI 3.3 • RDM PA • RDM 2.4 • RDM 3.6 • TS PA • VV PA • VV 2.1 • VV 2.3
Suppliers	• CAR PA • DAR PA • DAR 2.1 • DAR 2.3 • EST 2.1 • EST 2.2 • EST 2.3 • EST 3.2 • MPM PA • MPM 1.1 • MPM 2.1 • MPM 2.2 • MPM 2.3	• MPM 2.4 • MPM 2.5 • MST PA • MC PA • MC 2.1 • MC 2.3 • MC 2.4 • MC 3.1 • MC 3.2 • MC 3.4 • PLAN PA • PLAN 2.1 • PLAN 2.2	• PLAN 2.3 • PLAN 2.4 • PLAN 2.5 • PLAN 2.6 • PLAN 3.1 • PLAN 3.4 • RDM PA • RDM 2.3 • RDM 2.4 • RDM 3.3 • RDM 3.6 • RSK 3.4
Virtual	• ESEC 2.2	• PLAN 3.4	• PAD 3.5

Appendix J: CMMI Crosswalks

Accelerate your compliance and improvement journey with a CMMI Crosswalk, a comprehensive and easy-to-use mapping solution designed to align the CMMI practices with relevant ISO standards.

Whether you are working toward dual certification, enhancing process maturity, or ensuring alignment between frameworks, these crosswalks provide clear, side-by-side comparison of the CMMI model practices with the corresponding ISO clauses and requirements. The CMMI Crosswalks serve as an indispensable reference for quality managers, compliance teams, auditors, and consultants seeking to streamline process integration and reduce redundancies in documentation and implementation.

Key Features:

- Detailed mappings of CMMI Practice Areas (PA) and practices to ISO standards requirements
- Covers all CMMI domains
- Supports and enables multiple ISO standards using a single common approach
- Organized for quick reference and traceability during audits or assessments
- Ideal for gap analysis, audit preparation, and integrated management systems

Benefits:

- Save time and reduce costs with unified compliance efforts
- Anticipate and be more resilient to market and technology changes
- Minimize duplicate work by identifying overlapping process requirements
- Gain insights into areas of strength and improvement across frameworks
- Ensure a smoother path to multi-standard certification

Each crosswalk is available with the CMMI Model Viewer Plus subscription. The CMMI to ISO Crosswalks are the trusted tool for aligning global best practices and building a mature, compliant, capable, and high-performing organization. Refer to the [CMMI Crosswalks](#) resource page to find out more.

The CMMI Crosswalks are released in related bundles, beginning with the CMMI Crosswalk – AI Bundle, which includes ISO/IEC 42001:2023, ISO/IEC 23053:2022, ISO/IEC 23894:2023, ISO/IEC 31000:2018, an AI Intellectual Property Questions file, a Quick Start Guide, and companion summary documents for each ISO standard in addition to the individual crosswalks.