

## **Transcript for the Achieving CMMI® v1.2 the Rational Way Flash Presentation**

### ***Description***

This presentation is about how the Rational Unified Process and Rational tools support the 22 process areas of the CMMI. The emphasis of this presentation is on the staged representation of the CMMI Maturity Level 2, however, we do address all maturity levels which means we cover all process areas for all levels.

The Rational tools have been mapped to the CMMI process areas and is provided in a Rational RequisitePro project as well as in a Rational SoDA-generated Word document. These are provided.

A high level overview of the CMMI is also presented. What this presentation is not is a substitute for CMMI training nor is this an attempt to make you an expert on the CMMI.

### **Module 1: CMMI the Rational Way: Overview**

<b>Slide</b>	<b>Narration</b>
1-1	<p>This presentation is about the Rational tools supporting the 22 process areas of the CMMI. The emphasis is on the staged representation of Maturity Level 2, however, we do address all maturity levels which means we cover all process areas.</p> <p>The Rational tools have been mapped to the CMMI process areas and we'll show you that mapping throughout the presentation.</p> <p>We'll also provide you with a high level overview of the CMMI.</p> <p>What this presentation is not is a substitute for CMMI training nor is this an attempt to make you an expert on the CMMI. So let's get started.</p>
1-2	<p>We've been given permission by the Software Engineering Institute to reproduce some of their content and we're acknowledging that in this copyright.</p>
1-3	<p>This presentation is divided into several modules. Module 1 provides a high level overview of the CMMI, why you might pursue an initiative in CMMI, and several best practices.</p> <p>Module 2 addresses a CMMI Level 2 experience for the Requirements Management process area.</p> <p>Modules 3 through 8 addresses the remaining process areas in maturity level 2.</p>

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	<p>Modules 9 through 11 address process areas in level 3, level 4, and level 5.</p> <p>Module 12 is a summary and a wrap-up.</p>
1-4	<p>So what is CMMI? It stands for Capability Maturity Model Integration. It consists of best practices for product development, maintenance, and services, and it also covers the entire lifecycle. It provides an opportunity to avoid or eliminate stove pipes and barriers through integrated models that transcend disciplines. CMMI tells you what you should do; not how to do it. It covers bodies of knowledge also known as disciplines – those are software engineering, systems engineering, and integrated product development.</p> <p>The CMMI was formed to sort out the problem using multiple capability models and it combines three source models – those are CMM for Software, Systems Engineering Capability Maturity Model, and the Integrated Product Development Capability Maturity Model.</p>
1-5	<p>CMMI consists of 22 process areas. A process area is a cluster of related practices that satisfy goals for that process area. Examples of process areas are Requirements Management, Project Planning, Verification, Validation, Causal Analysis and Resolution, etc.</p> <p>CMMI contains two model representations – Staged, which has maturity levels 1 through 5 and addresses the maturity of the organization at that level; and Continuous, which has capability levels 0 through 5 and addresses the capability of a process area at that level.</p> <p>Staged is more structured than Continuous. You actually execute one stage at a time addressing the process areas in that stage. Each maturity level requires you to address all the process areas in that maturity level.</p> <p>Continuous is more flexible than staged. You can improve different processes at different rates but there are some limitations on the organization's choices due to some dependencies among some process areas.</p>
1-6	<p>The staged representation is 5 maturity levels – Initial, Managed, Defined, Quantitatively Managed, and Optimizing.</p> <p>At Maturity Level 1, processes are usually ad hoc and chaotic. The organization does not depend on proven processes and they may often produce products and services that work, however, they're often overbudget and they don't meet their schedules.</p> <p>At Maturity Level 2, requirements are managed and processes are planned, performed, measured, and controlled. The projects employ skilled people who have adequate resources to produce controlled outputs, involve relevant stakeholders, are monitored, controlled, and reviewed.</p>

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	<p>At Maturity Level 3, processes are well-defined and understood and are described in standards, processes, tools, and methods. These standard processes are used to establish consistency across the organization.</p> <p>At Maturity Level 4 we have predictable process performance. We'll establish quantitative objectives for quality and process performance and use them as criteria for managing processes.</p> <p>At Maturity Level 5, we're dealing with continual process improvement. An organization continually improves its processes based on a quantitative understanding of the common causes of variation inherent in processes. It focuses on continually improving process performance through incremental and innovative process and technological improvements.</p>
1-7	<p>The continuous representation is organized by four categories. These are process management, project management, engineering and support. Each category contains process areas, for example, the engineering category contains Requirements Management, Requirements Development, Technical Solution, Product Integration, Verification and Validation.</p> <p>An organization can choose to improve the performance of one process area or several process areas at one time so this makes the continuous representation more flexible than the staged representation.</p> <p>The order of improvement that an organization chooses should be based on the business objectives and the risk mitigation that are important to the organization.</p> <p>Continuous applies to an organization's process improvement in an individual process area.</p> <p>There are five capability levels which range from 0 through 5.</p> <p>Level 0 is incomplete, which means a process is either not performance or partially performed.</p> <p>Level 1 is performed and this satisfies the specific goals of the process area.</p> <p>Level 2 is managed and is a performed capability at level 1 that has the basic infrastructure in place to support the process.</p> <p>Level 3 is defined. It is a managed capability at Level 2 that is tailored to an organization's standard processes according to the organization's tailoring guidelines.</p> <p>Level 4 is quantitatively managed and is characterized as quantitatively managed process which means that the process is defined at Capability Level 3 and is</p>

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	<p>controlled using statistical and other quantitative techniques.</p> <p>Level 5 is optimizing and is characterized as an optimizing process which means the process is quantitatively managed at Capability Level 4 and is improved based on understanding of the common causes of variation inherent in process.</p>
1-8	<p>This is the CMMI big picture. The Staged column represents the staged representation. The pyramid represents each maturity level and the colors in the pyramid synch up with the colors in the Process Areas column. So the Maturity Level 3, which is the cyan color, synchs up with the cyan color in the Process Areas. Maturity Level 3 contains Requirements Development, Technical Solution, Verification, Validation, etc.</p> <p>The boxes under the pyramid list all of process area achronyms for each maturity level.</p> <p>The Process Areas column contain all the process areas in the CMMI. The process area blocks are color coded as explained previously for the staged representation.</p> <p>The text in the Process Areas column is color coded for the continuous representation in the Continuous column. For example, the Requirements Mangagement text is in dark green which synchs up with the dark green in the Engineering category in the Continuous column. Organizational Process Focus, which is red text, synchs up with the red Process Management category in the Continuous column.</p> <p>The Continuous column reflects the continuous representation. The graph shows that process areas can be at different capability levels. The colors in the graph have no significance.</p> <p>The flow chart under the graph shows the four catagories of the continuous representation and the process areas in each category. Each category is color coded with the text in the Process Area column as well as with the acronym.</p>
1-9	<p>Each process are has model components. These model components are Process Area, Purpose Statement, Introductory Notes, Related Process Areas, Specific Goals, Specific Practices, Typical Work Products, and Subpractices.</p> <p>The key on the left indicates whether the model component is required, expected, or informative.</p> <p>This presentation only introduces the generic goals and generic practices. We will not specifically be addressing any of those.</p> <p>We will address the specific goals and specific practices and we'll go into detail</p>

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	<p>on specific goal number 1 and its subpractices.</p> <p>The specific goals and generic goals are required which means an organization must achieve this to satisfy a process area.</p> <p>The expected components describe what an organization may implement to achieve a required component. Expected components guide those who implement improvements or perform appraisals. Expected components are the specific practices and the generic practices.</p> <p>Informative components provide details that help organizations get started in thinking about how to approach the required and expected components. An example of an informative component are the purpose statement, the introductory notes and the subpractices.</p>
1-10	<p>A specific goal describes the characteristics that have to be present to satisfy the process area. A specific goal is a required model component and is used in appraisals to help determine if a process area is satisfied.</p> <p>A specific practice describes an activity that is important in achieving a specific goal. The specific practice describes the activities that are expected to result in an achievement of a specific goal in a process area. A specific practice is an expected model component.</p>
1-12	<p>A generic goal applies to multiple process areas. It describes the characteristics that must be present to institutionalize the process that implements the process area. A generic goal is a required model component and is used in appraisals to determine whether a process area is satisfied.</p> <p>A generic also applies to multiple process areas and describes an activity that is considered important in achieving the associated generic goal. A generic practice is an expected model component.</p>
1-13	<p>There are 5 generic goals and each generic goal is made up of 1 or more generic practice.</p> <p>Generic Goal 1 supports and enables achievement of the specific goals of the process area by transforming identifiable input work products to produce identifiable output work products.</p> <p>Generic Goal 2 is a process that is institutionalized as a managed process. It means you are performing the process.</p> <p>Generic Goal 3 is a process that is institutionalized as a defined process. The purpose is to establish or maintain a description of the process that is tailored from the organization set of standard processes to address the needs of a specific instantiation.</p>
1-14	<p>Generic Goal 4 means the process is institutionalized as a quantitatively</p>

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	<p>managed process. The purpose is to establish and maintain quantitative objectives for the process and stabilize the performance of the process.</p> <p>Generic Goal 5 means the process is institutionalized as an optimizing process. The purpose is to ensure continuous improvement of the process in fulfilling the relative business objectives of the organization. It also identifies root causes of problems.</p>
1-15	<p>Let's look at a specific goal and specific practices that are associated with the Requirements Management process area. The Requirements Management process area has 1 specific goal and that's Manage Requirements. The specific goal is a required model component. The associated specific practices are expected model components.</p> <p>The Requirements Management process area is introduced at Maturity Level 2. Remember that specific goals and specific practices vary from one process area to another process area.</p>
1-16	<p>Now that we have had a high level overview of CMMI, let's talk about why an organization might choose to pursue a CMMI initiative.</p> <p>Companies are more software intensive than they used to be. They're now relying more on software than they did 20 years ago. A CMMI initiative may also differentiate it from the competition. The differentiation may make the difference between being successful or not. It may determine who gets a contract. It may even be required to bid on some contracts.</p> <p>It also provides opportunities to eliminate stove pipes and barriers by forcing and promoting communication. Information has to be shared to be successful. This means that stakeholders will be collaborating on a regular basis using the same processes. It also means that integrated processes for software and systems will be in place.</p>
1-17	<p>Over the years you've probably seen or heard about the chaos report from the Standish Group. This shows us progress companies may or may not be making on software development projects. First let's talk a little bit about the definition of success, challenged, and failure.</p> <p>Success means the project is completed on time and on budget with all features and functions originally as specified.</p> <p>Challenged means the project is completed and operational, but overbudget, late, and with fewer features and functions than initially specified.</p> <p>Failure means the project is canceled before completion or never implemented.</p> <p>Notice on the pie chart that we see that more than 50 percent of projects are challenged.</p>

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	<p>The bar chart shows a set from 1994 to 2004 there have been incremental improvements. For example, from 1994 to 2004 the number of projects that succeeded increased from 16 percent to 29 percent. The number of failed projects has decreased from 31 percent to 18 percent, but actually rose 3 percent from 2002 to 2004. And the challenged projects have stayed basically the same in the 53 percent vicinity from 1994 to 2004.</p>
1-18	<p>So what are the some of the benefits of using CMMI? A report from the Software Engineering Institute at Carnegie Mellon Institute shows us that organizations have seem pretty significant improvement in areas such as cost, schedule, and productivity. This data is based on 35 organizations both large and small. All of the organizations in the report explicitly attribute their achievements to guidance provided by CMMI. These categories include a wide variety of measures each selected by the participating organizations to demonstrate improvements in areas of importance to their particular business goals and objectives. The numbers from 2005 are similar. A particular note are the highest improvement numbers shown in the technical report. A link to the report is provided at the end of this presentation [Module 12].</p>
1-19	<p>We've seen data like this in the past and this information comes from the Standish Group. The top ten list is usually the same from study to study although the reasons may change order. CMMI supports the reason for success. For example, in the Requirements Management Specific Practice 1.2 Obtain Commitment to Requirements, it says you should obtain commitment to requirements from the project participants. Generic Practice 2.7 Identify and Involve Relevant Stakeholders are just a few of the examples that support reason number 1 in the chart. The top ten reasons for success are found throughout the CMMI. It stands to reason that if you don't do the top ten, your chances for success are limited.</p>
1-20	<p>We have another study that compares successful projects versus failing projects. It stands to reason that a successful project has effective project planning and failing projects do not.</p> <p>This article is derived through analysis of about 250 large software project at or above ten thousand function points in size that were examined by the author's company between 1995 and 2004.</p> <p>Even though this data varies from the previous top ten reasons for success, the issues can still be addressed by CMMI. Example are, but not limited to, the Project Planning process area at maturity level 2. Cost estimating is in the Project Planning process area. Measurements are in the Measurement and Analysis process area. Milestones are mentioned throughout CMMI in Project Monitoring and Control, Integrated Project Management, and Organizational Process Focus using Generic Practice 2.10. Change Management is incorporated into the Requirements Management and the Configuration Management process areas. Quality control is in Process and Product Quality Assurance.</p>

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	<p>The point is that no matter what the issue, CMMI seems to cover it.</p>
1-21	<p>You may also choose to pursue CMMI because you have a governance initiative.</p> <p>So what is governance?</p> <p>First of all, governance allows you to establish chains of responsibility, authority, and communication. This lets us know who is doing what.</p> <p>It also allows you to establish a measurement policy and control mechanisms to ensure that you're doing things correctly.</p>
1-22	<p>Why would you pursue a governance issue?</p> <p>Primary reason is strategic alignment. If your processes are not strategically aligned with the business, the processes are probably not effective because they don't support the direction the organization is headed.</p> <p>You may need to reduce risk. Adhering to governance reduces risk and increases the chances of success because you actually have to acknowledge and deal with risk as opposed to ignoring it.</p>
1-23	<p>Compliance initiatives can be addressed by CMMI. Compliance is documenting and proving governance is in place and basically its ensuring that you are doing governance.</p> <p>The type of compliance is dependent upon specific needs such as Sarbanes-Oxley, HIPPA, and CFR-11 – these types of things will drive your compliance initiative.</p>
1-24	<p>Another reason to pursue a compliance initiative is because you have to. You may have certain regulations you have to adhere to such as HIPPA. You may also need the ability to demonstrate you can deliver functionality that supports a specific regulation and you may also need to have the ability to defend yourself in a legal setting.</p> <p>This is really about proving you're doing things correctly and being able to prove that you're doing things correctly.</p>
1-25	<p>There is a difference between governance and compliance. Governance is about doing the right thing and compliance is about doing things right.</p> <p>CMMI supports both governance and compliance but it does not ensure either governance or compliance. You can use CMMI to create governance and compliance friendly processes. Remember that CMMI tells you what to do, not how to do it. Therefore, you can create CMMI processes that meet both governance and compliance initiatives.</p>
1-26	<p>Now let's talk about some best practices. These are based on real-world experience.</p>



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	<p>You need to build a good internal team.</p> <p>The first thing you should do is create one team for each process area. Don't spread your teams thin – for example, don't have one team work on the Requirements Management, Project Planning, and Configuration Management process areas. The skill sets might not be correct and the process can be too much.</p> <p>The next thing that you should do is communicate why CMMI. Everyone should understand why the organization is pursuing CMMI. If they won't support the CMMI initiative, consider removing them from the team.</p> <p>The third thing you need to do is attend CMMI training classes. CMMI classes are mandatory for some team members.</p> <p>The fourth thing you need to do is find internal skills that correspond to process areas. Your team should have some experience in the process areas. Experienced project managers are a good fit for the Project Planning process area. Requirements analysts are a good fit for the Requirements Management and Requirements Development process areas.</p> <p>The fifth thing you to do is find a strong leader – someone who's a good decision maker. This helps you avoid analysis paralysis. You need a leader who has the ability to say no and knows when to do so. Your process does not need to be perfect and may never be perfect. The leader needs to know when it's good enough so you can move forward.</p>
1-27	<p>You should keep your process teams small – 5 to 7 people is enough and 5 is probably better. Too many can really slow down the team.</p> <p>The next thing you need to do is conduct periodic assessments with an appraiser. When you think your process is in good shape, ask a CMMI appraiser to look at it. This is called a SCAMPI C. This gives you a good idea if your process is on track.</p> <p>The next thing you should do is pilot each process area. This allows you to conduct process improvement during process creation. You do this before final appraisal. Don't wait for final appraisal to test the process. You can pilot your process to see how well it works. It may work on paper but not so well in practice.</p>

## Module 2: Requirements Management (REQM)

Slide	Narration
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2-1	In this module, we'll talk about the Requirements Management process area using examples from a real customer engagement.
2-2	The Requirements Management process area is also known as REQM. The is the REQM definition as defined in CMMI. Basically this process area deals with managing all requirements in the project.
2-3	<p>The customer created a software engineering process group, also known as the SEPG. All process area teams reported to the SEPG. The REQM process area was analyzed and the initial process was created by one IBM consultant based on experience and expertise.</p> <p>The process was created independent of tools. Concepts from the Rational Unified Process, also known as RUP, were utilized without actually using the word, 'RUP', because RUP was not used at the customer site. However, the requirements management discipline in RUP mapped well with the REQM process area. So the process was based on concepts from RUP, experience, and was geared towards what was not currently working at the organization. You do need to know what is and what isn't working. Things that are working can be reused in the CMMI process.</p>
2-4	<p>This is the Specific Practice 1.1 in the REQM process area. An overall REQM process document was created that addressed the REQM process area for maturity level 2. Some elements of the REQM process area were moved to other process documentation, for example, requirements change management – Specific Practice 1.3 information – was moved to the overall change management process documentation.</p> <p>Stakeholders were derived from the customer's known stakeholder list, but was supplemented by stakeholders from RUP to use as examples. We did the same thing with roles and responsibilities.</p> <p>Attribute candidates were identified based on what the customer is using today and what they thought they might use in the future. We stated that attributes and their values would be captured in the requirements management plan as identified by RUP.</p> <p>Criteria the requirements were analyzed by were the attributes identified earlier. It's important to know that the criteria and attributes were identified as starting points. It was not meant to be an all-encompassing list, however, we did identify things we thought were mandatory.</p>
2-5	Once the initial process was created, it was taken to and reviewed with the SEPG and updated. This was an iterative process, so as the changes were made, we reviewed them, we documented them, and we took them back to the SEPG and we re-reviewed them.
2-6	Your process can be created independent of specific tools but you should look for opportunities for automation. Automation of manual process can enhance your overall process effort. The process can be created using Rational Method Composer, however, Rational Method Composer was not used at this customer

	<p>engagement. Specific Practice 1.1 was partially handled via attributes with Rational RequisitePro. Rational Portfolio Manager could also be used because it also makes use of attributes.</p> <p>Specific Practice 1.3 ties requirements to changes, defects, and enhancements. This can be handled by integrating requirements in RequisitePro with defects and enhancements in Rational ClearQuest. Something similar can be done in Rational Portfolio Manager.</p> <p>Specific Practice 1.4 deals with the traceability with requirements to things like defects, enhancements, design, and test cases. Requirements in RequisitePro can be traced to other requirements in RequisitePro as well as design elements and use cases in Rational Software Architect (RSA). RequisitePro can be integrated with ClearQuest TestManager (CQTM) to trace requirements to defects, enhancements, and test plans. Rational Portfolio Manager has a similar capability.</p> <p>Without automation, the process can become cumbersome and difficult to use.</p>
2-7	<p>When the process is automated using tools, monitoring and controlling process as indicated in Generic Practice 2.8 becomes easier because most tools provide measures. The Rational Unified Process provides guidance.</p> <p>Keep in mind that some elements of your process may ultimately reside in another process area's documentation but should always be referenced in your specific process documentation.</p>
2-8	<p>This is a picture of the Rational Unified Process. The Rational Unified Process provides best practices and guidance for successful software development. The requirements discipline in the Rational Unified Process was used as guidance for the customer's REQM process area. For example, stakeholder examples, attribute examples, documentation examples such as use cases and the requirements management plan were all used as starting points.</p>
2-9	<p>This is the requirements workflow from the requirements discipline of the Rational Unified Process. Elements of the requirements discipline were used throughout the REQM process area and were combined with the customer's unique needs.</p>
2-10	<p>Although the use of specific tools was not documented in the process, tools were used. Rational RequisitePro was used to capture things like requirements, requirements traceability, and attributes. It also allows the generation of measures and the tracking of requirement changes. It was integrated with Rational ClearQuest to trace defects to requirements.</p> <p>For the REQM process area, Rational RequisitePro was the automation tool of choice. It was already in use by the customer and had been in use for several years.</p>
2-11	<p>Rational Portfolio Manager is a project and portfolio management solution. It is more than a requirements solution. It has the capability to capture requirements,</p>

	defects, enhancements, and attributes. These are all things that are relevant in the REQM process area. You can create tasks from requirements. It is integrated with Rational RequisitePro, and it allows you to manage documentation and configuration management of requirements artifacts. The Rational Portfolio Management was not used at this customer engagement.
2-12	<p>The Rational Method Composer can be used to help you design and create your process. It helps you deliver and manage customized and consistent sets of processes, practices, and guidance.</p> <p>The Rational Unified Process provides process guidance and management. Refer back to the slide – RUP: Requirements Management Activities, slide 9 – for a high level overview of the requirements discipline in RUP.</p>
2-13	<p>These are the Rational tools that supports some parts of the REQM process area. We won't cover all of the tools in the graphic.</p> <p>RequisitePro integrates with our development tools and this supports Specific Practice 1.2 Maintain Bi-directional Traceability of Requirements.</p> <p>Rational ClearQuest can be used to manage requirements changes and this supports Specific Practice 1.3 by integrating RequisitePro and ClearQuest.</p> <p>Use the Rational Unified Process to identify and involve relevant stakeholders. This supports Generic Practice 2.7.</p>

### Module 3: Project Planning (PP)

Slide	Narration
3-1	In this module, we'll be discussing the CMMI Level 2 Project Planning process area.
3-2	The Project Planning process area is also known as the PP area. This is the definition of the PP process area as defined by CMMI. In the PP process area, you are developing things like project plans, creating estimates, and establishing the scope of the system. If you're using the Rational Unified Process, a good place to start is the software development plan.
3-3	This is the Rational Unified Process. The project management discipline supports the PP area quite effectively.
3-4	This is the Project Management workflow from the Rational Unified Process. The project planning task in the graphic supports the PP process area, however, other tasks within the Project Management discipline also supports the PP process area. The RUP's Project Management activities also support a variety of other process areas, for example, Develop Measurement Plan supports the Measurement and Analysis process area. Develop Monitoring and Control Processes supports the Process and Monitoring Control process area.
3-5	These are the specific goals and practices for the PP process area. Only Specific Goal 1 and its specific practices will be addressed in detail the following slides.

3-6	<p>Tools listed are some of the tools that best support the specific practice, however, these are not the only tools that support the specific practice. A complete list of the tools is documented in Rational RequisitePro at the end of this module. Please note that this is the pattern throughout the presentation.</p> <p>Rational Method Composer and the Rational Unified Process are common themes throughout this presentation. You can use Rational Method Composer to create the process and the Rational Unified Process for process guidance. You'll see them throughout the presentation.</p> <p>For Specific Practice 1.1, the focus is on the work breakdown structure and the work products or their equivalent.</p> <p>Rational Portfolio Manager allows you to create a work break down structure and the work products.</p> <p>QSM Estimation Plug-in for Rational Method Composer is a measurement and estimation methodology supported by the SLIM-suite of tools. It includes key processes for estimate planning, measurement, project estimating, project control, and adaptive forecasting.</p> <p>These processes support industry best practices process maturity standards such as CMMI and ISO 9000.</p>
3-7	<p>For Specific Practice 1.2 we are dealing with work products and the size of those things relevant to that work product. You can use the Rational Unified Process to help identify those work products and the QSM plug-in to help estimate the work products.</p>
3-8	<p>Specific Practice 1.3 asks you to identify the lifecycle which will be used. Examples of lifecycles are iterative development which is supported well by the Rational Unified Process and the waterfall method.</p> <p>Specific Practice 1.4 deals with things like project effort and cost. The QSM plug-in can be used for guidance.</p>
3-9	<p>Rational Portfolio Manager, also known as RPM, is a project and portfolio management solution. It supports the PP process area quite well. RPM has a number of capabilities. You can develop and manage your budgets and estimates as well as develop a work breakdown structure. You can develop project plans as well as any other documentation. You also have the ability to monitor the health and status of your project.</p>
3-10	<p>As we've already discussed, Rational Method Composer can be used to help you design and develop your process.</p> <p>The Rational Unified Process can be used for project guidance.</p>
3-11	<p>These are the Rational tools that map to the PP process area.</p> <p>You can use Rational Portfolio Manager to create a project plan which supports</p>

	<p>Specific Goal 2. This means you establish the budget and the schedule (Specific Practice 2.1), identify risks (Specific Practice 2.2), and plan for project resources (Specific Practice 2.4).</p> <p>You can use Rational Asset Manager to plan for data management, which supports Specific Practice 2.3. This means you can archive data and access archived data.</p> <p>You can use the Rational Unified Process to define the project lifecycle, which supports Specific Practice 1.3.</p>
3-12	<p>The QSM Measurement &amp; Estimation Plug-in was developed by QSM, a Ready for Rational partner. It provides key processes for project estimation and planning. It is supported by the QSM SLIM-Suite of tools and is integrated with Rational Portfolio Manager and Rational Method Composer.</p>

## Module 4: Project Monitoring and Control (PMC)

Slide	Narration
4-1	In this module, we'll address the Project Monitoring and Control process area Level 2.
4-2	The Project Monitoring and Control process area is also known as the PMC. This is the PMC definition as defined by CMMI. The PMC process area allows you to monitor and manage the performance of the project. You'll be recording project performance, data management, and commitments. You'll also be conducting reviews on project process, performance, and issues.
4-3	This is the Rational Unified Process. The Project Management discipline supports the PMC process area, however, other disciplines also support PMC. For example, the Requirements discipline addresses stakeholders involved in requirements management and this supports PMC Specific Practice 1.5 Monitor Stakeholder Involvement.
4-4	This workflow is from the Project Management discipline in the Rational Unified Process. Monitor & Control is an activity in the Project Management workflow. The activity consist of things such as tasks, roles, and work products. This activity captures the daily and continuing work of the project manager, including monitoring project status, reporting to stakeholders, and dealing with issues.
4-5	These are the specific goals and specific practices for the PMC process area. We'll only discuss Specific Goal 1 and its associated specific practices.
4-6	<p>Specific Practice 1.1 is about monitoring the health and status of the project.</p> <p>You'll be monitoring things such as budget and schedule. Rational Portfolio Manager does this very well.</p> <p>Practical Software and Systems Measurement Plug-in for RMC helps you define</p>

	<p>the measures and things you measure. The PSM plug-in will be discussed in more detail in the Measurement and Analysis process area.</p>
4-7	<p>Again we see Rational Method Composer to help you design and develop your process and the Rational Unified Process for process guidance.</p> <p>Rational Porfolio Manager does a great job in tracking resources and resource skills.</p> <p>You can use Rational ProjectConsole to collect and monitor planning parameters in a dashboard.</p>
4-8	<p>Specific Practice 1.2 makes sure you follow through.</p> <p>You can document your commitments in Rational Asset Manager. You can integrate Rational Asset Manager with Rational ClearQuest and create a workflow to enforce follow through.</p>
4-9	<p>Specific Practice 1.3 focuses on dealing with risks. A risk is a problem that may occur and risks need to be monitored and mitigated.</p> <p>Create and track a risk record in Rational ClearQuest or Rational Portfolio Manager.</p> <p>Store your risk management plans in Rational Asset Manager.</p>
4-10	<p>Specific Practice 1.4 deals with the follow through of data that has to be managed. Are you doing what you said you would? Are you storing requirements like you said you would? Are you documenting defects and enhancements and issues according to plan?</p> <p>Document the activities in Rational Asset Manager, update those activities as needed and review them with your team in Rational Asset Manager.</p>
4-11	<p>Specific Practice 1.5 ensures stakeholders are doing what they're supposed to be doing.</p> <p>Document their activities in Rational Asset Manager and compare that with what they're really doing.</p>
4-12	<p>Specific Practice 1.6 is about communication. Are you on track?</p> <p>Use Rational Asset Manager to store the results of your reviews. Use the PSM plug-in to determine if the results are on track.</p>
4-13	<p>Dcoument your change requests in Rational ClearQuest to Rational Portfolio Manager.</p>
4-14	<p>Specific Practice 1.7 is more about communication. Create things like iteration plans and store them in Rational Asset Manager</p> <p>Review your risks in Rational ClearQuest.</p>
4-15	<p>Continue to document the results of your reviews, action items, and decisions in Rational Asset Manager</p>

	Track your defects and issues in Rational ClearQuest.
4-16	Use Rational Portfolio Manager to manage the overall health and status of your project. Manage and monitor resources, budgets and estimates, resource roles, skills, risks, and risk parameters, issues, and defects.
4-17	Use Rational Method Composer to help you design and develop your process. Use the PMC activity in the project management discipline in the Rational Unified Process for overall guidance.
4-18	<p>These are the Rational tools that support the PMC process area.</p> <p>Use Rational Portfolio Manager to monitor project risks – Specific Practice 1.3.</p> <p>Use Rational ClearQuest to analyze issues – Specific Practice 2.1. Create an issue record or use the number of defects as an issue.</p> <p>Use the Rational Unified Process for guidance for Conduct Progress Reviews – Specific Practice 1.6 – and conduct milestone reviews – Specific Practice 1.7.</p> <p>Use Rational Asset Manager to monitor your data management – Specific Practice 1.4.</p>

## Module 5: Supplier Agreement Management (SAM)

Slide	Narration
5-1	This module address the Supplier Agreement Management process area
5-2	The Supplier Agreement Management process areas is also known as SAM. This is the SAM definition as defined by the CMMI. This deals largely with the acquisition of products, components, and services from a supplier. This also includes things such as commerical off-the-shelf products, development tools, and test environments.
5-3	This is the Rational Unified Process. There is no specific discipline for SAM, however, other disciplines may support SAM. The Rational Unified Process has a Commercial Off-the-shelf (COTS) plug-in that helps address this. This process is based on the Software Engineering Institute Evolutionary Process for Integrating COTS-Based Systems, also know as EPIC. The COTS plug-in contains process but no document templates. An update to this COTS plug-in is in work.
5-4	These are the specific goals and specific practices in the SAM process area. We'll only address Specific Goal 1 and its supporting specific practices.
5-5	Specific Practice 1.1 wants to know where the acquisition is coming from. For example, are you purchasing a COTS product? Are you using an in-house vendor or is it a combination of both. You can document this process in Rational Portfolio Manager.



	<p>Specific Practice 1.2 wants to know who provides you with what you need. Document your suppliers and requirements in Rational RequisitePro and trace these requirements to suppliers to see who can do what. Or document your suppliers in Rational Portfolio Manager and evaluate them using scorecards.</p>
5-6	<p>Track your supplier risks in Rational ClearQuest or Rational Portfolio Manager.</p> <p>Use guidance from the COTS plug-in to help you select your supplier.</p>
5-7	<p>Specific Practice 1.3 deals with things like statements of work, legal contracts, etc. This is about what you expect your supplier to do or provide.</p> <p>Document changing requirements in Rational RequisitePro.</p> <p>Create a statement of work or other documents in Rational Portfolio Manager.</p>
5-8	<p>Track your supplier agreements in Rational Asset Manager. Review and comment on those agreements with your team using Rational Asset Manager.</p>
5-9	<p>Track requirements and changes to the requirements in Rational RequisitePro.</p> <p>Review the COTS plug-in for guidance on changing your process.</p>

## Module 6: Measurement and Analysis (MA)

Slide	Narration
6-1	<p>This module addresses the Measurement and Analysis process area.</p>
6-2	<p>The Measurement and Analysis process area is also known as MA. This is the MA definition as defined by the CMMI. The Measurement and Analysis process area specifies the objectives of measurement and analysis such as they aligned with information needs and objectives. It also specifies the measures, analysis techniques, and mechanisms for data collection, storage, reporting, and feedback. It addresses the implementing of the collection, storage, and analysis of the data. It addresses providing objective results that can be used in making informed decisions and taking appropriate corrective actions, objective planning and estimating, track actual performance against established plans and objectives, and identify and resolve process related issues, and provide a basis for incorporating measurement into additional processes in the future.</p>
6-3	<p>This is the Rational Unified Process. It doesn't have a measurement specific discipline, however, measurement guidance is provided in the Project Management discipline.</p> <p>Other disciplines may provide ideas for measures. For example, the test discipline has a concept for measuring quality, for evaluating quality and product quality, which provides you with things to consider regarding measures.</p> <p>The Business Modeling discipline discusses a task – identify business goals and KPIs. This task describes a combined approach, top-down and bottom-up, for</p>

	<p>identifying business goals and associated key performance indicators.</p> <p>The Requirements discipline talks about attributes which can be used to capture measures.</p> <p>The Rational Unified Process for Practical Software and Systems Measurement plug-in for RMC will be discussed in detail later in this module.</p>
6-4	<p>Notice that we're back at the project monitoring and control task in the project management workflow. In order to monitor, you need measures so you know what to compare and contrast.</p> <p>The Develop Measurement Plan task describes how to develop a measurement plan by identifying management goals and deducing appropriate measures. The measurement plan describes the goals which the project must track towards a successful completion and the measures to be used to determine whether the project is on track. The task Develop Measurement Plan is done once per project in the inception phase as part of the general planning activity. The measurement plan may be revised like any other section of the software development plan during the course of the project.</p> <p>The Monitor &amp; Control Project activity addresses a project measurement work product. The project measurement work product provides the storage for the project's measurement data. It is kept current as the measurements are made available. It also contains the derived measures that are calculated from the primitive data and should also store information about how the derived measures are obtained.</p> <p>Reports on the status of the project, for example, progress towards goal, functionality, quality, and so on, expenditures, and other resource consumption are produced using the project measurements.</p>
6-5	<p>These are the specific goals and specific practices for the MA process area. We'll address in detail only Specific Goal 1 and its associated specific practices.</p>
6-6	<p>Specific Practice 1.1 wants you to look at the things you want to measure. Do you want to reduce the number defects found in test? Would you like to decrease cost and reduce your schedule?</p> <p>Use the PSM plug-in for further measurement guidance.</p> <p>Document those things in Rational Portfolio Manager.</p> <p>Use Rational ProjectConsole to display your measure dashboard and use that information as input to improve your objectives.</p>
6-7	<p>Store your information needs in Rational Asset Manager and trace your measurement objectives in Rational RequisitePro.</p>
6-8	<p>Specific Practice 1.2 is about creating the measures.</p>

	Use the PSM plug-in to help you identify the measures and document those measures in Rational ProjectConsole.
6-9	<p>Specific Practice 1.3 is concerned with how you will obtain and store your measurement data.</p> <p>This could be your procedure: Collect defect measures from Rational ClearQuest. Collect requirements measures from Rational RequisitePro. Use Rational ProjectConsole to collect that data from Rational ClearQuest and Rational RequisitePro. Create dashboards and share those dashboard with your team.</p>
6-10	<p>Determine the measures and look for the source for that data.</p> <p>Rational Asset Manager provides asset reuse measures.</p> <p>Rational ClearQuest provides measures relevant to defects, enhancements, issues, risks, etc.</p> <p>And don't forget to look at the PSM plug-in for guidance.</p>
6-11	<p>Now it's time to create and collect the specific measures. Are you interested in the number of defects associated to the requirements? How about the number of defects found in test? Are you interested in how much of the budget has been spent?</p> <p>Use the Rational tools to collect these measures and consolodate the measures using Rational ProjectConsole displayed in dashboards.</p> <p>Automate the collection process as much as you can. Make sure your tools do the work, not your people. You'll get your data faster and it will be much more accurate.</p>
6-12	It probably won't take you long to determine if your measurement techniques are working and optimized. Use the tools to refine those techniques and measures.
6-13	<p>Specific Practice 1.4 addresses how measurement data will be analyzed and reported. Refer to the PSM plug-in for further guidance. Select the appropriate tools. Determine how your data will be communicated. Will you be doing reviews? Status reports? Will they be conducted daily, weekly, bi-weekly? How will you view them? Will you post them to a website?</p> <p>Use Rational ProjectConsole to post all your data to a website and make it available to every your team members.</p>
6-14	<p>Is the data really being reported the way you want? If you don't like looking at lists of categories of defects, put the data on a dashboard in Rational ProjectConsole and create a meter gauge.</p> <p>Use RequisitePro to create an Excel chart.</p> <p>Are the measures being evaulated on a timely basis? If not, use Rational</p>

	ProjectConsole to generate measures according to your timeframe.
6-15	<p>Use Rational Portfolio Manager to identify, collect, and analyze different types of measurement data.</p> <p>Use Rational ProjectConsole to collect data from different Rational tools and display that data in a dashboard.</p>
6-16	<p>Use Rational Method Composer to design and develop your process and RUP for process guidance.</p> <p>The PSM plug-in is based on actual measurement experience on DoD, government, and industry programs. Measurement professionals from a wide variety of organizations participated in the project. The PSM represents the best measurement practices used within the software and systems acquisition and engineering communities. PSM treats measurement as a flexible process, not as a list of pre-defined graphs or reports. The process is adapted to address the specific software and systems information needs, objectives and constraints unique to each project. The PSM measurement process is defined by a set of nine best practices called measurement principles.</p>
6-17	<p>These are the Rational tools that support the MA process area. Look to your tools to provide your measures. Use Rational ProjectConsole to pull measures out of Rational tools to create a measurement dashboard.</p> <p>Use Rational ClearQuest to track defects and enhancements and generate measures from that. Integrate Rational ClearQuest with Rational RequisitePro and use Rational RequisitePro or Rational ClearQuest to determine how many defects or enhancements trace to them.</p> <p>Use Rational Asset Manager to determine how many assets are being reused.</p>
6-18	<p>This is a high level overview of the RUP for PSM Plug-in for RMC. PSM gives you implementation guidance, a list of sample measures, and is the base document for ISO/IEC 15939. Practical Software and System Measurement is an objective process for analyzing issues, risks, and financial management – focusing on software project management. PSM provides government and industry managers with objective information for making sound decisions and for meeting cost, schedule, and technical objectives. It's based on actual DoD, government, and industry experience representing the best practice in the software and systems engineering communities.</p>

## Module 7: Process and Product Quality Assurance (PPQA)

Slide	Narration
7-1	This module address the Process and Product Quality Assurance process area.
7-2	The Process and Product Quality Assurance process area is also known as the PPQA. This is the PPQA defined by the CMMI. PPQA evaluates performed process, work products and services against the applicable process descriptions,

	standards, and procedures. It identifies and documents non-compliant issues, provides feedback to project staff and managers on the results of quality assurance activities, and ensures that non-compliant issues are addressed.
7-3	<p>This is the Rational Unified Process. PPQA is more about process and product quality than testing. The test discipline really supports the Verification and Validation process areas, however, the test discipline also addresses some aspects of quality as other discipline do.</p> <p>In the Configuration and Change Management discipline, Rational ClearQuest can be used to create corrective action records or enhancements. Rational ClearQuest could also be used to track non-compliance. Concepts from the configuration and change management discipline support change management which can be used to support PPQA to fix non-compliance.</p>
7-4	<p>This is the workflow for the test discipline in the Rational Unified Process.</p> <p>The Achieve Acceptable Mission activity delivers a useful evaluation results of the stakeholders of the test effort where use evaluation result is assessed in terms of the evaluation mission. The test effort can be interpreted as evaluating products and processes.</p> <p>The Assess and Advocate Quality focuses on supporting the overall effort in identifying the quality gap, assessing their impact and risk, and finding effective solutions. It identifies and advocates resolutions of defects that are a serious detrimental effect on software quality. It allows you to monitor the progress of and the support of the appropriate completion of changes that improves software quality to the required level. You also advocate a timely resolution of defects that prevent or impair the testing effort.</p> <p>PPQA is about evaluating processes, work products, identifying non-compliance and reporting non-compliance and fixing it.</p>
7-5	These are the specific goals and the specific practices of the PPQA process area. We'll address in detail only Specific Goal 1 and its associated specific practices.
7-6	Specific Practice 1.1 deals with evaluating the designated performed processes against the appropriate process descriptions, standards, and procedures. You're really looking at evaluation reports, non-compliance reports, and corrective actions. Reports can come from tools like Rational Asset Manager, Rational ProjectConsole, and Rational RequisitePro. The PSM plug-in can also provide additional guidance.
7-7	Use the measures in Rational ProjectConsole to identify non-compliance. Capture lessons-learned in Rational Asset Manager.
7-8	Specific Practice 1.2 deals with evaluating the designated work products and services against the appropriate process descriptions, standards, and procedures. Create the designated work products from tools like Rational ClearQuest, Rational Asset Manager, and Rational ProjectConsole. Create the criteria in a tool. For example, maybe we'll compare the number of defects found in elaboration iteration 1 to the number of defects found in elaboration iteration 2.

	Create this in Rational Asset Manager or look at what you've created in Rational ProjectConsole and determine if that's still valid.
7-9	Now we're actually doing the evaluation. Evaluate the work products that either reside in a Rational tool or can be created by a Rational tool.
7-10	You have to adhere to a schedule, evaluate work products, or perform incremental evaluations based on milestones defined in Rational Portfolio Manager.
7-11	Keep track of what didn't work, what you learned, and how you can fix it. Track non-compliance and lessons learned in Rational Asset Manager.
7-12	Use Rational Method Composer to design and build process.  Rational AppScan and Rational Policy Tester are just a few examples of Rational tools that support the QA part of PPQA. Identify your QA objectives for Web applications and security and use Rational AppScan and Rational Policy Tester to identify non-compliance.
7-13	These are the Rational tools that have been mapped to the PPQA process area.  You can use the test tools to help improve the quality of work products.  Rational AppScan and Rational Policy Tester can provide measures that determine if your process is meeting the standard your organization has defined for Web application vulnerabilities. They also provide compliance reports. This supports Specific Practice 1.1 Objectively Evaluate Processes.  Rational Asset Manager can help you maintain records. This supports Specific Practice 2.2 Establish Records.  Rational Portfolio Manager can be used to help you identify and involve relevant stakeholders. This supports Generic Practice 2.7.

## Module 8: Configuration and Change Management (CM)

Slide	Narration
8-1	This module addresses the Configuration Management process area.
8-2	The Configuration Management process area is also known as CM. This is the CM definition as defined by the CMMI. The CM process area identifies the configuration of selected work products, controls changes to configuration items, and builds or provides specification to build work products from the configuration management system. It addresses the maintenance and integrity of baselines and provides accurate status and current configuration data to developers, end-users, and customers.
8-3	This is the Rational Unified Process. The Configuration and Change Management discipline addresses the CM process area. This discipline explains how to control and synchronize the evolution of the set of work products

	composing a software system.
8-4	<p>This is the Configuration and Change Management workflow in the Rational Unified Process.</p> <p>Specific Practice 1.3 Create a Release Baseline of the CM process area is supported by the Rational Unified Process Manage Baseline and Releases activity. This activity ensures that a consistent set of related or dependent artifacts can be identified as part of the baseline for various purposes, such as the identification of the release candidate, product versions, artifact maturity, or completeness.</p> <p>The activity, Create Project CM Environment supports Specific Practice 1.2 Establish a Configuration Management System. This addresses the creation of an environment where the product can be developed and built, and also the development of a repository.</p>
8-5	These are the specific goals and specific practices in the CM process area. We'll address only Specific Goal 1 and its associated specific practices in detail.
8-6	Specific Practice 1.1 addresses identifying configuration items, components, and related work products that'll be placed under configuration management. What are you going to version control? Will you version control your requirements, design, or test plans? Whatever you decide to version control, use Rational ClearCase.
8-7	<p>Specific Practice 1.2 deals with things like storage media, tools, and procedures for configuration management.</p> <p>Store and retrieve configuration items from Rational ClearCase.</p> <p>Store and recover achived versions of items from Rational ClearCase.</p>
8-8	<p>Store, update, and retrieve configuration management reports in Rational Asset Manager.</p> <p>Create configuration management reports from Rational ClearCase.</p>
8-9	<p>Specific Practice 1.3 deals with creating or releasing baselines for internal use or for delivery to the customer.</p> <p>Use Rational ClearCase for all your baseline needs.</p>
8-10	<p>Use Rational Method Composer to design and develop your process.</p> <p>Use Rational ClearCase to link your source code changes to activities. Connect your source code changes with build and release efforts for faster problem resolution.</p> <p>Rational ClearQuest supports Specific Goal 2. Track and manage software lifecycle changes and track and update defect records based on builds.</p> <p>Rational BuildForge associates build efforts with defects and automates and</p>

	accelerates build efforts. Rational BuildForge integrates with ClearCase and provides a consistent management layer for your production build and release processes.
8-11	<p>These are the Rational tools that map to the CM process area.</p> <p>Use RequisitePro to create a baseline of your requirement CM process area. This supports Specific Practice 1.3.</p> <p>Use the development tools to identify configuration items. This supports Specific Practice 1.1.</p> <p>Use Rational ClearCase and Rational ClearQuest to establish a configuration system. This supports Specific Practice 1.2.</p> <p>Use Rational Asset Manager as an asset repository and integrate it with ClearCase. This supports Specific Practice 1.2.</p> <p>Use Rational ClearQuest to track changes. This supports Specific Practice 2.1.</p>

## Module 9: Level 3 Process Areas

Slide	Narration
9-1	This module addresses the process areas at Maturity Level 3.
9-2	<p>Maturity Level 3 consists of 11 process areas. These 11 process areas build on the process areas in Level 2. The processes at Level 3 are tailored from the organization's set of standard processes that were created at Level 2.</p> <p>Processes at Level 3 are described more rigorously than processes at Level 2.</p>
9-3	<p>Rational Method Composer can be used to design and create your processes. The Rational Unified Process can be used for further process guidance. For example, the Analysis and Design discipline provides a workflow that supports the Technical Solution process area.</p> <p>The Test discipline provides a workflow that supports the Verification and Validation process areas.</p>
9-4	<p>These are examples of some of the Rational tools you could use to support a process area.</p> <p>Rational RequisitePro supports the Requirements Development process area.</p> <p>Rational Functional Tester, Rational Manual Tester, and Rational Performance Tester supports the Verification and Validation process areas.</p> <p>Rational Portfolio Manager supports the Risk Management process area.</p>



9-5	<p>These are the Rational tools that map to the Level 3 process areas.</p> <p>Use the Rational test tools to support the Verification and Validation process areas.</p> <p>Verification is about building it right, ensure the selected work products meet the requirements. Use the Rational test tools to identify and create test types, test parameters, test work products. This supports Specific Practice 1.3 Establish Verification Procedures and Criteria.</p> <p>Validation is about building the right thing. Demonstrate a product or a product component fulfills its intended use when placed in its intended environment. Use the Rational test tools to create validation reports and validation results. This supports Specific Practice 2.1.</p> <p>Use the Rational development tools to support the Technical Solution process area. This process area is about designing, developing, and implementing the solutions to requirements. The Rational development tools support Specific Goal 2 Develop the Design.</p>
9-6	<p>The Organization Process Definition is about establishing and maintaining a reusable set of organizational process assets and work environment standards. Use Rational Asset Manager to establish organizational process assets. This supports Specific Goal 1.</p> <p>Organizational Process Focus is about planning, implementing, and deploying organizational process improvements. Use Rational Asset Manager to deploy organizational process assets. This supports Specific Practice 3.1.</p>
9-7	<p>Product Integration is about assembling the product from product components and ensuring the product as integrated functions properly. Use the Rational test tools to confirm readiness of the product components in integration. This supports Specific Practice 3.1</p>
9-8	<p>Use the Rational Suite to cover all process areas at Level 3. The Suite contains several Rational products – the Team Unifying Platform, Rational PurifyPlus for Windows, Rational Rose Enterprise, and Rational Robot.</p>

## Module 10: Level 4 Process Areas

Slide	Narration
10-1	This module addresses the process areas at Maturity Level 4.
10-2	Maturity Level 4 consists of 2 process areas – Organizational Process Performance and Quantitative Project Management. The process areas at Level 4 build on the process areas at Level 3. Performance of processes is controlled using statistical and other quantitative techniques. At Level 4, some of the things

	<p>you have to consider are the collection, analysis, and interpretation or explanation of presentation of data. This includes graphs, tables of data, calculated data summerized, the generation of models, theories, and hypothesis, the development of instruments and methods for measurement, experimental control and manipulation of variables, collection of empirical data, modeling and analysis of data, and evaluation of result.</p>
10-3	<p>Rational Method Composer can be used to help you design and develop your process. The Rational Unified Process can provide further guidance.</p> <p>The PSM Plug-in provides further measurement guidance and the Project Management discipline can help you create the plans that you need.</p>
10-4	<p>Some of the Rational tools that support the OPP process area are Rational ProjectConsole, Rational ClearQuest, and Rational RequisitePro. These support the Specific Practice 1.2 Establish Process Performance Measures.</p> <p>Some of the Rational tools that support the QPM process area are Rational Portfolio Manager, Rational ClearQuest, Rational RequisitePro, and Rational ProjectConsole. These support Specific Practice 2.1 Select Measures and Analytic Techniques.</p>
10-5	<p>These are the Rational tools that map to the Level 4 process areas.</p> <p>The OPP process area deals with establishing and maintaining quantitative understanding of the performance of the organization’s set of standard processes in support of quality and process performance objectives.</p> <p>Use Rational RequisitePro to establish criteria of how well your requirements processes are working. Integrate Rational RequisitePro with Rational ClearQuest to trace defects and enhancements to requirements. The defects and enhancements encountered could indicate your requirements management or requirements development processes are not working well.</p> <p>The QPM process area deals with quantitatively managing the project’s defined process to achieve the project’s established quality and process performance objectives. Use Rational BuildForge to establish the project’s objectives. This supports Specific Practice 1.1.</p> <p>In the QPM process area, use the Rational test tools to meet Specific Practice 1.3 Select the Subprocesses that will be Statistically Measured. This will help you meet your test coverage objectives.</p> <p>Use Rational ClearCase to manage configurations – Generic Practice 2.6 for both the OPP and QPM process areas. These Rational tool types have already been covered in previous slides.</p>

## Module 11: Level 5 Process Areas

Slide	Narration
11-1	This module addresses the process areas at Maturity Level 5.
11-2	Maturity Level 5 consists of 2 process areas – Organizational Innovation and Deployment and Causal Analysis and Resolution. Maturity Level 5 builds on the process areas that were created in Level 4. The focus of Maturity Level 5 is process improvement.
11-3	Use Rational Method Composer to help you design and develop your process. Use Rational Unified Process for further process guidance. Look at the PSM plug-in for measurement guidance, the Project Management discipline for developing plans and monitoring the project, and the Configuration and Change Management discipline for defect management.
13-3	<p>The Rational tools for the OID and CAR processes are basically the same.</p> <p>In the OID process area, you can use Rational ClearQuest to collect enhancements while you use Rational ClearQuest to collect defects in CAR.</p> <p>Use Rational Asset Manager to store and review processes.</p> <p>Use Rational ProjectConsole to collect measures to compare and contrast processes after process improvement.</p>
13-4	<p>These are the Rational tools that support the Level 5 process area.</p> <p>OID addresses selecting and deploying incremental and innovative improvement that measurably improve the organization’s processes and technologies. Use Rational Asset Manager to deploy improvements. This meets Specific Goal 2. This ensures processes meet certain requirements and that processes are reviewed.</p> <p>The CAR process area identifies causes of defects and other problems and takes action to prevent them from occurring in the future. Use Rational ClearQuest and Rational ProjectConsole to defect data for analysis. This supports Specific Practice 1.1. You’re looking for the causes of problems.</p>

## Module 12: Summary and Resources

Slide	Narration
12-1	This module provides a summary of the presentation and the resources used.
12-2	<p>As we’ve shown, the Rational tools support all CMMI process areas. Some of these are individual tools, some are in suites, some are bundled, some are integrated.</p> <p>The Rational tools have been mapped to each process area. This mapping resides</p>

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	<p>in Rational RequisitePro. This mapping contains the purpose the tool serves for a process area and contains a description of each tool. A [Microsoft Word] report has been generated using Rational SoDA. This means you don't need Rational RequisitePro to view the mapping.</p>
12-3	<p>CMMI's continuous representation is not specifically addressed yet. Continuous and staged share many common practices and goals so the information that we have provided can still be of benefit to anyone using a continuous representation.</p>
12-4	<p>IBM is an acknowledged leader in the software development arena as identified by industry leaders (analysts).</p>
12-5	<p>IBM can also meet your needs in the CMMI services arena. We have a group of authorized lead assessors and SCAMPI lead appraisers. This group can provide standard and customized assessment, appraisal, and review services. They also provide CMMI training.</p> <p>Please contact IBM sales for more information.</p>
12-6	<p>The IBM Software Group provides software services specific to the Rational brand. They can help with process creation, tool implementation and training and mentoring.</p> <p>Please contact IBM sales for more information.</p>
12-7	<p>We've discussed a number of Rational Method Composer plug-ins. We've provided you with links to those plug-ins. There is no charge for the plug-ins listed here, but you must be using Rational Method Composer</p>
12-8	<p>We have several plug-ins that are designated as Ready for Rational and have been created by IBM partners.</p> <p>The first one is the Wipro plug-in for RUP-CMMI mapping. It distills the knowledge that Wipro has gained through implementation and understanding of the Rational Unified Process and the CMMI.</p> <p>The second plug-in is the QSM Measurement and Estimation Plug-in to the Rational Method Composer. This was created by QSM. This is a plug-in for project measurement, estimating, and control processes.</p> <p>You must contact the partners directly to purchase these plug-ins</p>
12-9	<p>The remaining slides identify those resources that were used in creating this presentation.</p>

### Resources

**IBM Rational Method Composer Product [Home Page](#)**

**IBM Rational Portfolio Manager Product [Home Page](#)**





## IBM Rational Unified Process, or RUP, Plug-ins for IBM Rational Method Composer

- [RUP with CMMI® Compliance Support V1.0 Plug-in Beta 2](#)
- [RUP for Practical Software and Systems Measurement \(PSM\) V3.0 and the PSM Standalone V3.0 Plug-ins.](#)  
Article: [Integrating systems measurement into your software and systems delivery process with the RUP for PSM Plug-in](#)
- [RUP for COTS Package Delivery PPlug-in V2.1.1](#)
- [IBM Rational Method Composer \(RMC\) V7.2 Plug-ins](#)

## IBM Partner-developed RUP Plug-ins for IBM Rational Method Composer

- [Wipro plug-in for RUP-CMMi mapping.](#)  
Webinar: [From Chaos to Continuous Improvement: Leveraging RUP Software Delivery Best Practices for CMMIR](#)
- [QSM Measurement and Estimation Plug-in to Rational Method Composer \(RMC\).](#)  
Webinar: [Project Planning with QSM SLIM Estimate and IBM Rational Portfolio Manager](#)

## Additional Resources (References)

- IBM Rational Tools to CMMI v1.2 Mapping Staged Representation Version 2.0
  - ➔ [Mapping in IBM Rational RequisitePro database](#) (zip, 203KB)
  - ➔ [Mapping report generated by IBM Rational SoDA](#) (610KB)
-  [Get the Microsoft® Word Viewer](#)
-  [Capability Maturity Model® Integration \(CMMI®\) Version 1.2 Overview](#) (600KB)
-  [Carnegie Mellon Software Engineering Institute. \(2006, August\). Performance results CMMI®- based process improvement, CMU/SEI-2006-TR-004 \[Electronic version\]](#) (3521KB)
-  [Get Adobe® Reader®](#)
- [Hartmann, D. \(2006, August 25\). Interview: Jim Johnson of the Standish Group. InfoQ.](#)
- [Putnam, L. \(2007, November 7\). Webinar: Software, measurement, estimation and control solutions for Rational users.](#)