

# Maturity Assessment Background

June 2014

## Maturity Assessment Background

Gaining Insight into Companies' PLM-Related Capabilities  
June 2014

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## Agenda

- Background on Maturity Assessments
- Executing the Survey
- Analyzing the Results
- Preparing a Report

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# Maturity Assessment Background

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## Why Do Maturity Assessments

- Gather quantifiable understanding of how well an individual, organization, or group performs in accordance with best practices in a particular area or discipline
  - PLM
  - S&A
  - Systems engineering
- Should be used in the context of other information known about the group
- Provides guidance for improvement in the area being assessed



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## How Maturity Assessments Work

*Measure an organization's maturity against a well-understood set of criteria*

- Maturity assessment models comprise multiple characteristics (processes, standards, data usage, etc.) of a particular discipline (e.g., PLM, SDM, systems engineering)
- Maturity assessment models investigate issues related to best practices of that discipline at a number of maturity levels
- When evaluated & measured, these provide current capability levels & can be used to identify potential improvements & goals for a company to improve that discipline
- When the model is applied to and shared by a number of organizations in a particular industry then it can provide an industry benchmark against which to evaluate those organizations



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## Maturity Assessment Definitions

*A structured approach to assessing an organization's ability to improve*

- **Elements & Key criteria:** the primary characteristics that must be considered when assessing each of the process, technology and organizational elements
- **Maturity levels:** labels for the characteristics that an organization is supporting better or worse
- **Maturity levels matrix:** establishes the mapping between the key criteria for a given organization, process, and technology element and its maturity stages  
That is, how the organization moves from one maturity level to the next
- **Maturity assessment surveys:** determines the current state of the organization's product lifecycle on the dimensions of organization, process, and technology



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## Maturity Assessment Background

- The assessment is driven by surveying a number of people (the more the better) with various roles in product realization (not limited to product development) from a company
- The methodology is based on work originally done to support
  - Capability Maturity Model® Integration (CMMI®)<sup>1</sup>
  - Readiness Assessment for Concurrent Engineering (RACE)<sup>2</sup>
  - But highly modified by CIMdata to address PLM and related strategies

1. Carnegie Mellon University
2. Concurrent Engineering Research Center  
West Virginia University



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## Assessment Results

*These will vary by organization and by individual respondent (1 of 2)*

- The methodology provides a relative assessment—against best practices characteristics built into the model—it does not provide an absolute measure of maturity
- Gaps against best practices identify the respondents' maturity position & can be easily seen in charts
  - That is, if the organization is at a low maturity for an element, then the gap from best practice is large, if a high maturity for any element, then the gap is small
- The model defines a set of levels of maturity (typically 3 or 5)
  - The higher the level, the more mature
  - These higher levels represent best practices by definition
  - Gaps are identified between the respondents' measured level and the higher levels defined in the model



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## Assessment Results

*These will vary by organization and by individual respondent (2 of 2)*

- The model suggests areas of improvement to process to pursue
  - Does not automatically provide a project plan for specific corrective actions
  - That is a consulting activity requiring additional knowledge of both the discipline being measured and the organization and how it functions
- In general, an organization will not attempt to meet the highest level of maturity for all of the elements measured in the model
  - Achieving the highest maturity may be extremely costly
  - Reaching the highest level in every category may not be required for business success or produce significant business benefits



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## 3 Areas of Assessment for PLM

*An example—different disciplines might explore other areas*

- PLM Organization
  - Examines how well the organization is structured, trained, and managed to apply a PLM strategy and to work with PLM processes and tools
- PLM Processes
  - Explores the processes used to support PLM including communication, change control, collaboration both inside and outside of the organization, use of defined product development processes, management disciplines, etc.
- PLM Technology
  - Determines the level of solution deployment to support a PLM strategy including consistency of tool use, how data is maintained, maturity of tools, tool and information integration, etc.



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## Elements and Associated Key Criteria

- Each assessment area has defined elements with key criteria related to each element
- The number of elements and the associated key criteria vary for each assessment area
- The survey questions are designed to identify and evaluate each of the elements based on the key criteria
- Individual questions may address multiple elements, so may be repeated
- Each element is rated and plotted against the maturity levels for that assessment area



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## Example Areas and Elements

Organization	Process	Technology
Openness	Customer Focus	Applications & Software Tools
Communication	Process Focus	Communication Services
Adoption	Management Systems	Coordination Services
Vision & Strategies	Process Agility	Integration Services
Team Management	Collaboration	Information Sharing Services
Recognition & Rewards	Leadership in PLM	
Roles & Responsibilities	Process Discipline	



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## Process Maturity Levels

*Maturity assessment*

Maturity Level	Definition
<b>Ad-hoc</b>	This stage is characterized by ill-defined procedures and controls and by disorganized teams that do not understand their assignments or how to operate effectively. Management of the product lifecycle is not applied consistently in projects, and modern tools and technology are not used consistently, if at all.
<b>Repeatable</b>	Standard methods and practices are used to monitor progress, requirements changes, cost estimation, etc. The process is repeatable. False teams (i.e., teams that don't use standard methods) may exist at this stage.
<b>Characterized</b>	The process is well defined and reasonably well understood. A series of process improvements have been implemented. There is a group responsible for implementing and monitoring the product lifecycle process. Conflict resolution is the principal focus of product teams.
<b>Measured</b>	The process is not only defined and understood but is also quantified, measured, and reasonably well controlled. Tools to control and manage the process are used. Uncertainty concerning the process outcome is reduced. True teams are used in the product lifecycle process.
<b>Optimizing</b>	A high degree of control is used across the process. The major focus is on significantly and continually improving operations by using process metrics and lessons learned.



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## Survey Questions

*Example for element: Leadership in PLM/SDM of PLM Process*

- Has PLM been mandated within the organization?
- Does senior management monitor the progress of the PLM (e.g., selection, implementation and adoption) project?
- Is senior management actively participating in the PLM project?
- Has a group (e.g., steering committee) been formed to oversee the PLM implementation?
- Is the steering committee active in the PLM project?
- Is (or will) the steering committee empowered to make organizational changes during the implementation of a PLM solution?



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## Survey Question Impact on Maturity

*Previous example*

	1	2	3	4	5
Has PLM been mandated within the organization?		1			
Does senior management monitor the progress of the PLM (e.g., selection, implementation and adoption) project?				1	
Is senior management actively participating in the PLM project?					1
Has a group (e.g., steering committee) been formed to oversee the PLM implementation?			1		
Is the steering committee active in the PLM project?		1			
Is (or will) the steering committee empowered to make organizational changes during the implementation of a PLM solution?				1	



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## Survey Question Answers

All questions are answered in 5 possible ways (1 of 2)

- Yes:
  - The process is well entrenched and consistently executed (i.e., the process is executed nearly always and is considered well entrenched and regularly executed as the standard process).
- No:
  - The process is not entrenched or is almost never executed (i.e., you should check No if the process is not executed to support ALL critical tasks).
- Some of the Time:
  - The process is not well entrenched and is inconsistently executed (i.e., the process is executed sometimes but not on a consistent basis (e.g., used by some product development programs but not ALL)).



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## Survey Question Answers

All questions are answered in 5 possible ways (2 of 2)

- Does Not Apply:
  - You have the required knowledge about your project or organization and the question asked, but you feel the question does not apply to your situation.
- Don't Know:
  - You are uncertain about how to answer the question.

	Yes	No	Some of the Time	Does Not Apply	Don't Know
1. Is the customer involved throughout the product development process (from concept or pre-proposal, through detailed design, to production, test, and delivery)?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Do most team members know the product requirements of their customer?	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Are procedures in place to ensure that the product development teams gather and respond favorably to changes in customer priorities?	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Are procedures in place to ensure timely customer input into product development projects?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>



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## Executing the Survey

- Determine who should take the survey
- Explain the purpose of the survey
- Provide an introductory letter, the URLs to the online surveys, and an expected completion date
- Each of the surveys takes about 20 to 30 minutes to complete
- Five possible answers for each question
  - Yes No Some of the Time Don't Know Not Applicable
- All definitions (terms, elements, answers) are define in the survey forms
- Can pause during a survey and complete it later



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## Loading the Data

- The data for each response is a row in an Excel spreadsheet exported from an online survey tool
- This data is copied into the Data tab for each area of the survey workbook
- Incomplete surveys are not counted, so there is no need to remove them

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## The Analysis

- Guidance for improvement comes from:
  - An analysis of the “Some of the Time” answers
  - An understanding of the organization, its processes, & its technologies
- Designed to be completed quickly
- The data is compiled into a Summary worksheet
- Using PLM Process as an example, the charts in the following section can be produced & used for reporting
- The basic analysis is produced automatically by the model
- Additional analyses may require some manual actions by a consultant or during interaction with the organization being measured



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## Multiple Analyses

*Guidance for where to go (1 of 2)*

- The basic analysis presents the Current Maturity level for each of the elements—it is created automatically
  - For example, “Some of the Time” answers are counted 50% as “Yes” & 50% as “No” answers
  - A good guide to the future potential is to look at the impact of being consistent in the application of processes & technologies—doing things done “Some of the Time” ALL of the time
- The potential short-term state analysis is found by setting a percentage (between 60% & 100%) of the “Some of the Time” answers to be “Yes” to present what could be achieved by simply following current procedures and standards more consistently



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## Multiple Analyses

*Guidance for where to go (2 of 2)*

- The “Long-Term” state requires setting element maturity levels to selected values based on your knowledge of the company, its business model, and its industry—this provides the basis for directing long-term investments and evolution

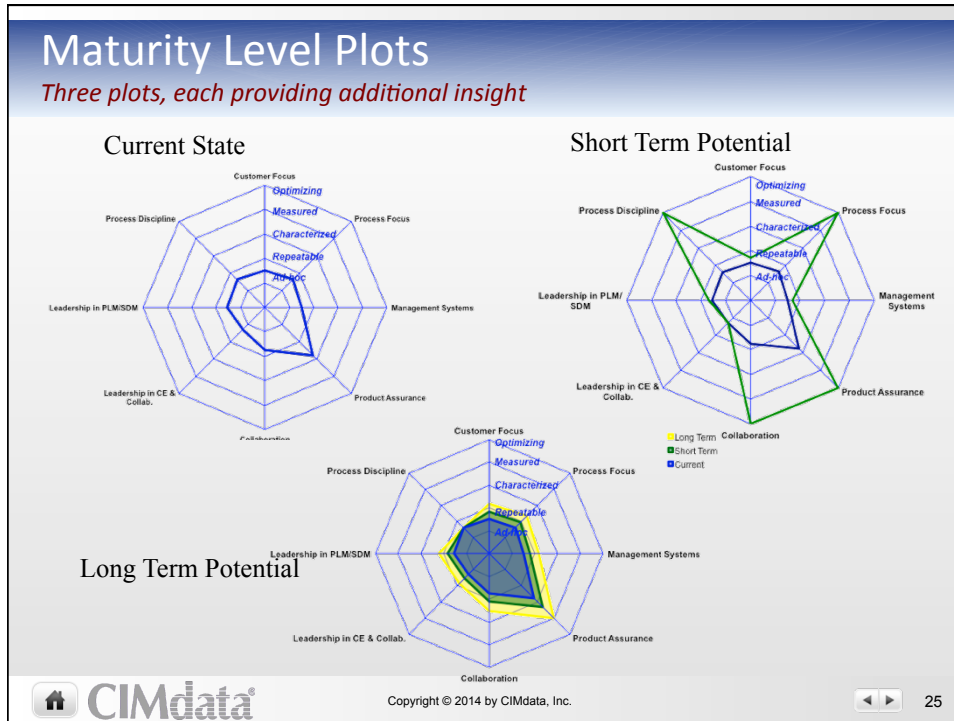


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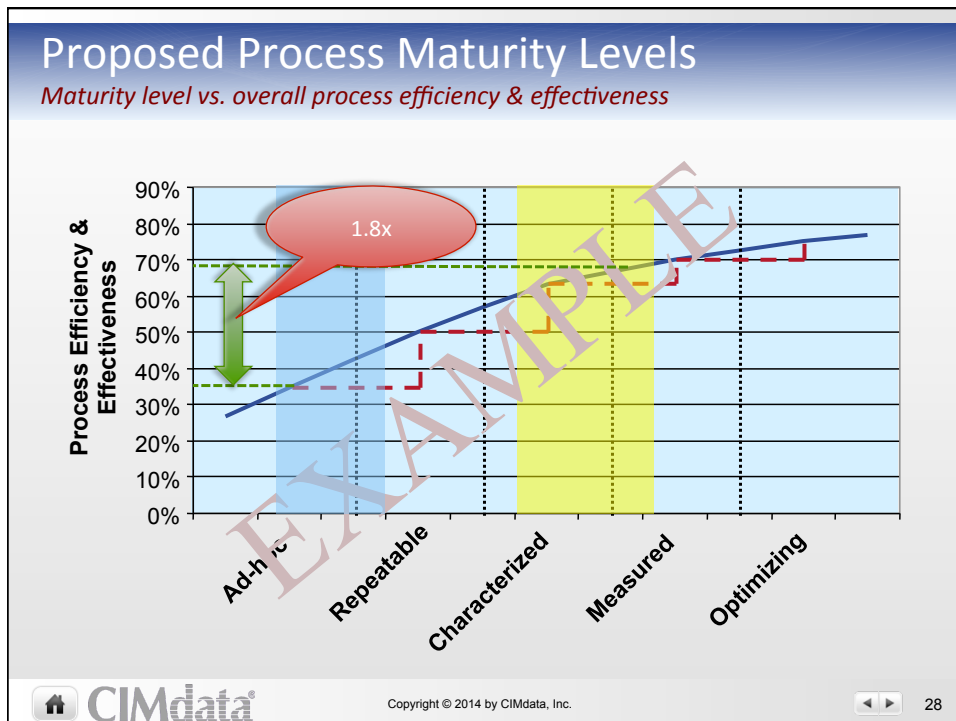
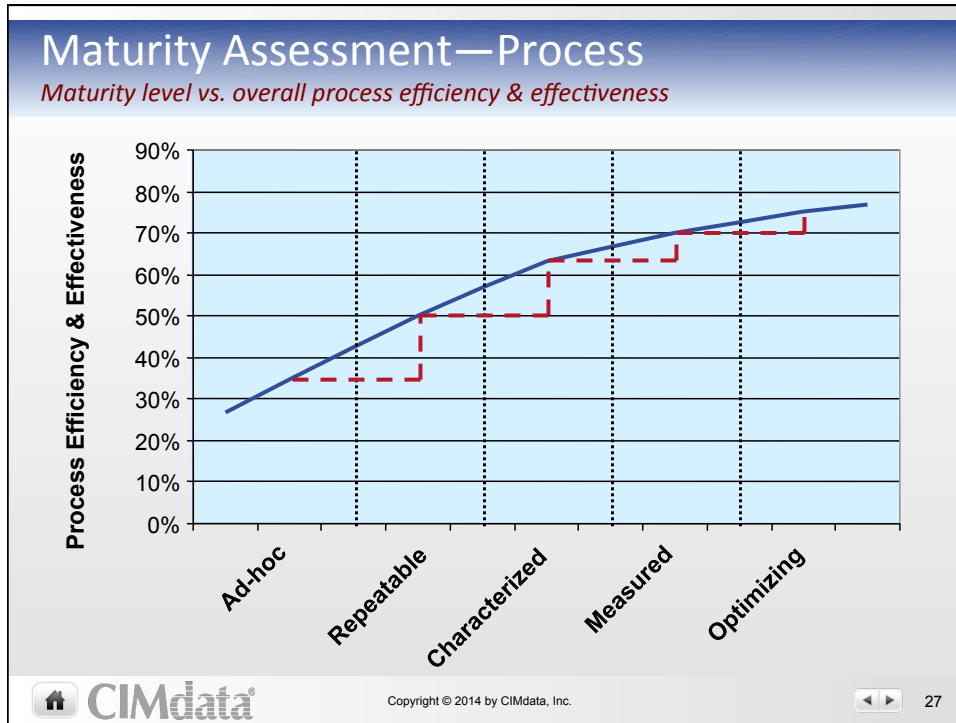


## Efficiency Improvements

- The following two slides show the impact of improving maturity on organizational process productivity and effectiveness
- They help determine what levels the enterprise want to achieve and what benefit will accrue from reaching higher levels of maturity
- The recommendation slides provide guidance to the company based on the results and analyses of the surveys
  - Those in this example reflect the results of surveys conducted by CIMdata with one of its clients

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## Review and Report Results

- Review results with the customer
- Use the process efficiency and effectivity charts to determine what the company wants to achieve
- Use the Summary workbook to do “What If” options
  - Change weightings of individual elements and/or key criteria
  - Change the percentages of “Some of the Time” answers to “All of the Time”
  - Reflect which is most important to help achieve process efficiency targets
- The system will use the final “What If” options to automatically create a report



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## FAQs

*What users often want to know (1 of 2)*

- Why are questions repeated or nearly duplicated?
  - A question may apply to more than one element & thus needs to be asked for each element
  - Some questions are nearly identical to help increase the importance for a criteria or element and to ensure consistency of the responses
- How are results levels for short- and long-term improvements decided?
  - For short-term, they can be inferred by changing “Some-of-the-Time” answers to be “Yes” answers
  - For long-term they are determined based on consulting experience and require an experienced consultant familiar with PLM and the company being surveyed



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## FAQs

*What users often want to know (2 of 2)*

- Does the model predict the monetary benefit of moving from one level to another?
  - No, that is a goal, but has not been implemented at this time



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