Carnegie Mellon
Software Engineering Institute

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CMMI® Overview for Executives

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Audience

This presentation is intended to serve as a tailorable base presentation that you can use to introduce CMMI to executives.

It is designed for executives who are not familiar with CMMI.

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Topics

Do You Need CMMI?

What Is CMMI?

How Can CMMI Benefit You?

Who Is Using CMMI?

How Can Executives Help?

Are You Settling for Less?

Plans are made, but not necessarily followed.

Work is not tracked against the plan; plans are not adjusted.

Requirements are not consistent; changes are not managed.

Estimates are way off; over-commitment is common.

When overruns become apparent, a crisis atmosphere develops.

Defects are discovered in test or, worse yet, by the customer.

Success depends on heroic efforts by competent individuals.

Repeatability is questionable.

What Happens in a Crisis?

Common responses to crises are

- people work faster and longer

- people are moved from project to project

- projects cut requirements

- projects add more people

- everyone cuts corners

- a hero saves the day

Have These Symptoms?

Missed commitments
- Late delivery
- Last minute crunches
- Spiraling costs

Inadequate management visibility
- Too many surprises

Quality problems
- Too much rework
- Functions not working correctly
- Customer complaints

Poor morale
- Frustrated people
- Inadequate control

Why Focus on Process?

It complements your focus on people:

- The experience and training of your work force is not always enough.
- Working harder is not the answer.
- A well-defined process can provide the means to work smarter.
- It shifts the "blame" for problems from people to the process.

It complements your focus on technology:

- Technology, by itself, will most likely not be used effectively.
- Technology, in the context of an appropriate process roadmap, can provide the most benefit.
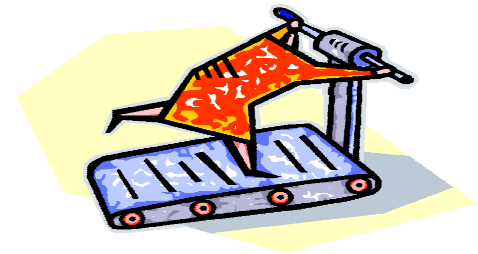
The Importance of Process

The quality of a system is highly influenced by the quality of the process used to acquire, develop, and maintain it.

- a long-established premise in manufacturing
- visible worldwide in quality movements in manufacturing and service industries (e.g., ISO standards)

Common Fallacies

I don't need process, I have …
- really good people
- advanced technology
- an experienced manager

Process …
- interferes with creativity
- introduces bureaucracy and regimentation
- isn't needed when building prototypes
- is only useful on large projects
- hinders agility in fast-moving markets
- costs too much

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What Is CMMI?

Capability Maturity Model Integration (CMMI) is a suite of products used for process improvement.

- Models

- Appraisal Methods

- Training Courses

CMMI Models -1

A framework that describes key elements of effective process

A guide to evolutionary improvement from ad hoc, immature activities to mature, disciplined processes

A description of practices for planning, engineering, and managing business processes that can help you achieve business goals related to things such as:

- cost
- schedule
- functionality
- product/service quality
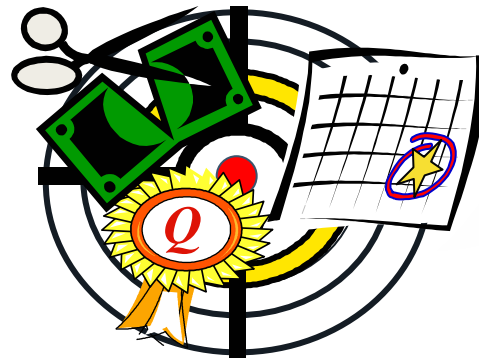
CMMI Models -2

A yardstick against which the maturity of an organization's product development, acquisition, and/or service-related processes can be measured and compared with industry state of the practice

A basis for planning improvements to your business processes

CMMI best practices tell you WHAT to do but neither HOW to do it nor WHO should do it.
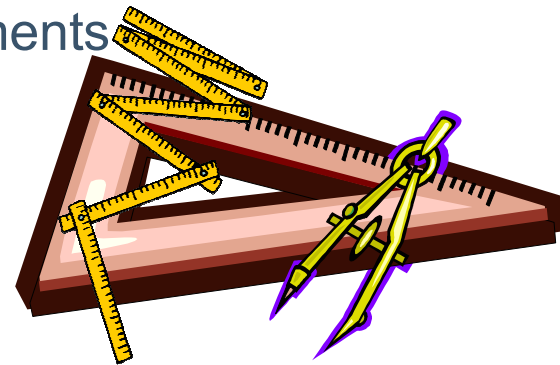
Model Features

CMMI

- supports process integration and product improvement.

- enables the integration of multiple disciplines into one process-improvement framework that helps to eliminate inconsistencies and reduces duplication.

- provides a framework for introducing new disciplines as needs arise and therefore reduces the cost of implementing model-based improvement.

- is designed to build on legacy process improvement efforts and investments.

CMMI Best Practices Are Used for

The development, acquisition, and maintenance of products and services

Software-intensive products and services

Product and service lifecycles from conception through delivery and maintenance

Benchmarking your organization against others in a variety of industries

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CMMI Appraisals (SCAMPI^{SM})

Measures an organization's processes using a CMMI model as a yardstick

Uses a formalized appraisal process

Involves senior management as an appraisal sponsor

Focuses the appraisal on the sponsor's business objectives

Observes strict confidentiality and non-attribution of data

Focuses on follow-on activities and decision making based on the appraisal results

Three appraisal Classes: A, B, and C

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SCAMPI Classes A, B, and C

Approach
SCAMPI C

Deployment
SCAMPI B

Institutionalization
SCAMPI A
(Maturity Levels)

Maturity Levels - How Long?

Empirical evidence suggests that there is a variability in the amount of time it takes organizations to move from one maturity level to the next using the SW-CMM. Early CMMI results appear to be comparable.

1992 to Present[*]

Maturity Level	Median # Months
level 1 to 2	22
level 2 to 3	21
level 3 to 4	25
level 4 to 5	15

[*] Software CMM® - CBA IPI and SPA Appraisal Results through April 2003

CMMI Adoption Is Not One-Size-Fits-All

Some upgrade from SW-CMM or EIA 731

Some adopt only CMMI

Some adopt CMMI with or in addition to other approaches, such as
- Six Sigma
- Agile Methods
- TSP/PSP
- ISO 9000/9001
- IEEE Standards
- RUP
- Balanced Scorecard

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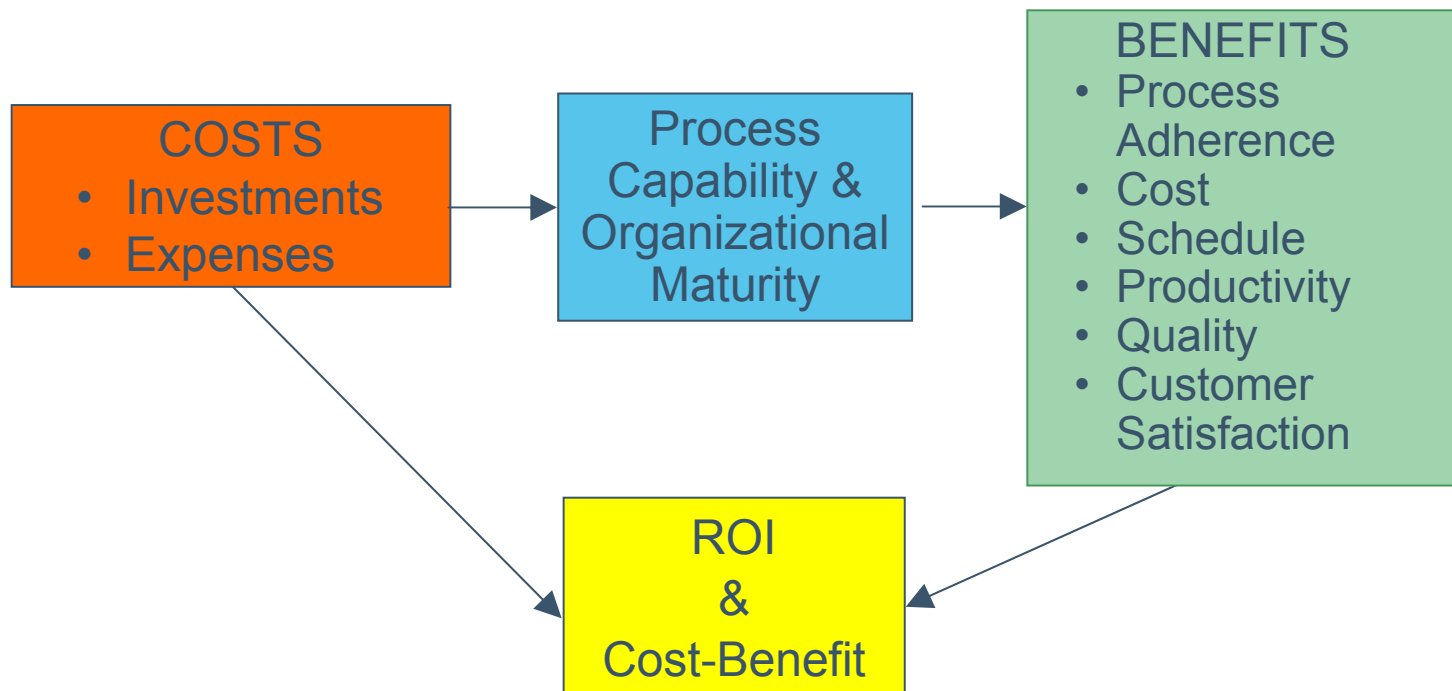
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Costs and Benefits of CMMI

COSTS
- Investments
- Expenses

Process Capability & Organizational Maturity

BENEFITS
- Process Adherence
- Cost
- Schedule
- Productivity
- Quality
- Customer Satisfaction

ROI
&
Cost-Benefit

Costs May Vary

The cost of CMMI adoption is highly variable depending on many factors, including organization

- size

- culture

- organization

- current processes

Regardless of the investment, we've found that organizations experience a respectable return on their investment.

Performance Measures - CMMI

The next slide provides examples from 13 different organizations that achieved results in one or more of the following six categories of performance measures:
- Cost
- Schedule
- Productivity
- Quality
- Customer Satisfaction
- Return on Investment

Performance Measures

Improvements	Low	Median	High	# of data points
Cost	5%	20%	83%	7
Schedule	15%	66%	95%	11
Productivity	11%	28%	60%	4
Quality	20%	47%	72%	6
Customer Satisfaction	10%	33%	55%	3
Return on Investment	2:1	3.8:1	13:1	4

Published Benefits

For more detailed information about CMMI benefits, see the report, *Demonstrating the Impact and Benefits of CMMI: An Update and Preliminary Results*

- SEI special report released in October 2003

- Based on case studies, supplementary materials, and comprehensive literature review

- On the SEI Web site at http://www.sei.cmu.edu/publications/documents/ 03.reports/03sr009.html

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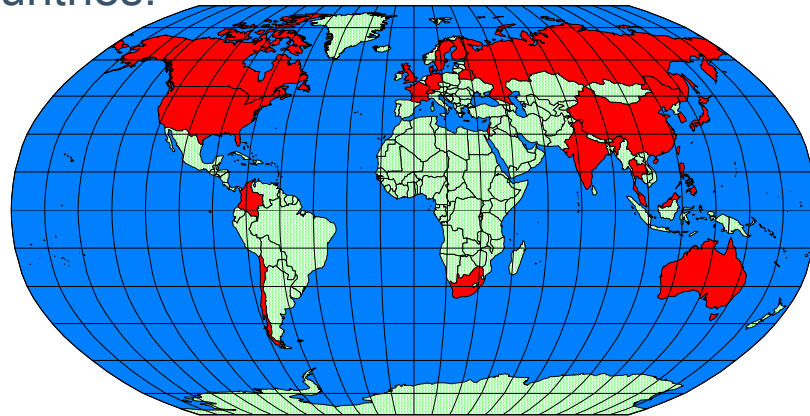
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CMMI Is Being Adopted Worldwide

Appraisals of organizations using CMMI were conducted in the following countries:

Argentina, Australia, Belarus, Canada, Chile, China, Columbia, Denmark, Finland, France, Germany, India, Israel, Japan, Korea, Republic of Malaysia, Philippines, Russia, Singapore, South Africa, Spain, Sweden, Switzerland, Taiwan, Thailand, United Kingdom, United States
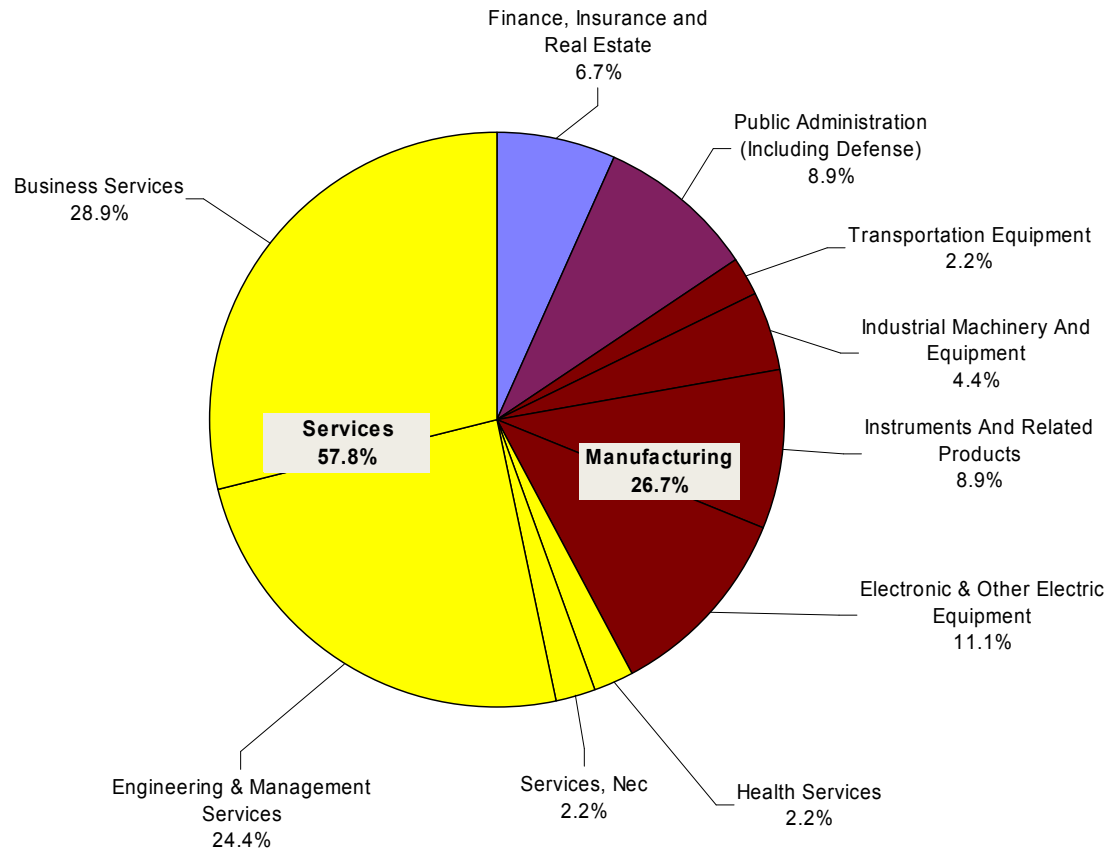
Early Adopters

CMMI Early Adopters are people who have agreed to talk to you about their experiences, including benefits. Here are just a few:

- Alan Brown at Boeing

- Jan Unruh at Bosch

- Sarah Bengzon at Accenture

- Alan Kennedy at General Dynamics

- Gary Natwick at Harris Corporation

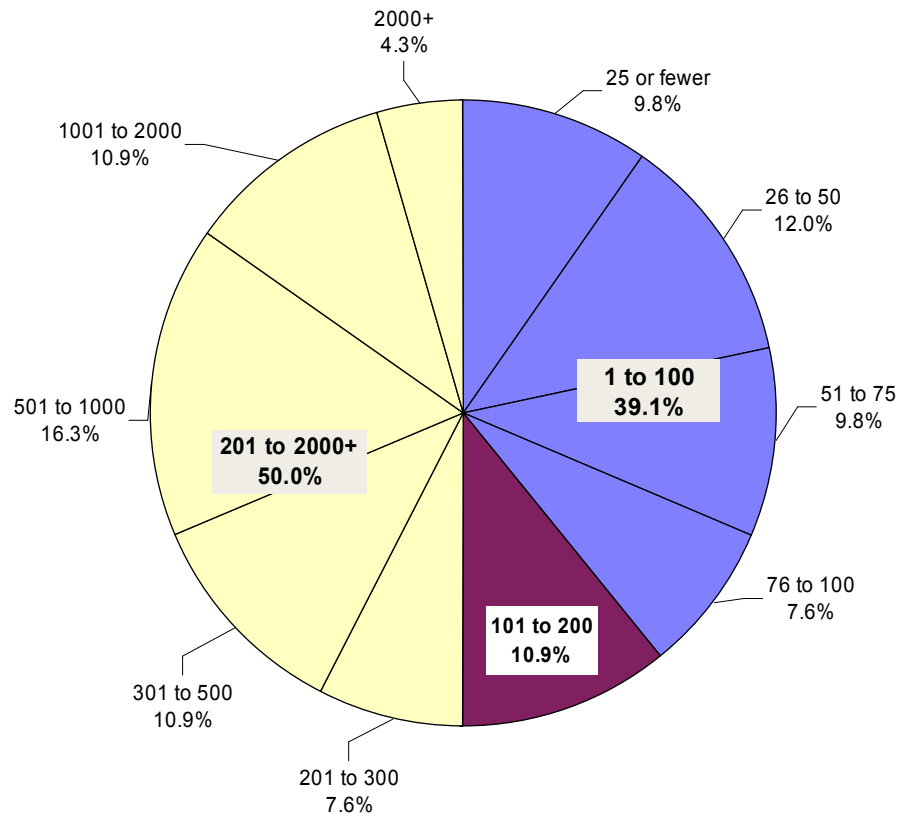The full list of Early Adopters and their contact information is at http://www.sei.cmu.edu/cmmi/adoption/early-adopters.html.

CMMI Is Domain-Independent

Finance, Insurance and Real Estate
6.7%

Public Administration (Including Defense)
8.9%

Transportation Equipment
2.2%

Industrial Machinery And Equipment
4.4%

Instruments And Related Products
8.9%

Electronic & Other Electric Equipment
11.1%

Business Services
28.9%

Services
57.8%

Manufacturing
26.7%

Engineering & Management Services
24.4%

Services, Nec
2.2%

Health Services
2.2%

Based on **45** organizations reporting SIC code. For more information visit: http://www.osha.gov/oshstats/sicser.html

CMMI Is Size-Independent

2000+
4.3%

1001 to 2000
10.9%

501 to 1000
16.3%

201 to 2000+
50.0%

301 to 500
10.9%

201 to 300
7.6%

101 to 200
10.9%

76 to 100
7.6%

51 to 75
9.8%

1 to 100
39.1%

26 to 50
12.0%

25 or fewer
9.8%

Based on **92** organizations reporting size data

Organizations Using CMMI

Accenture, Boeing, Bosch, Dyncorp, EDS, Ericsson, Fannie Mae, Fujitsu, General Motors, Hitachi, Honeywell, IBM, Infosys, Intel, J. P. Morgan, KPMG, L3 Communications, Lockheed Martin, Motorola, NASA, NEC, Nokia, Northrop Grumman, NRO, Polaris, Raytheon, Reuters, SAIC, Samsung, Social Security Administration, Tata C. S., U.S. Air Force, U.S. Navy, U.S. Treasury Department, Wipro, Zurich Financial Services

See the achievements of organizations that have chosen to make their appraisal results public at
http://seir.sei.cmu.edu/pars/pars_list_iframe.asp

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Your Role as an Executive

To ensure success of your process improvement program, take these steps:

1. Use your influence to help the organization adopt CMMI.

2. Choose the best people to manage the process improvement effort.

3. Be a sponsor and monitor the process improvement effort.

4. Be an advocate and spokesman.

5. Ensure that resources are available:
   - people
   - money

Barriers to Expect

As an executive, you can identify these barriers and help the organization get past them:

- "This doesn't apply to me" syndrome

- Resources drained from process improvement by other "more important" work

- Resistance to change of any kind

Five Reasons to Adopt CMMI

CMMI helps your organization to …

1. Improve delivery of performance, cost, and schedule

2. Collaborate with external stakeholders and integrate their expectations into day-to-day activities

3. Provide competitive world-class products and services

4. Implement an integrated enterprise business and engineering perspective

5. Use common, integrated, and improving processes for systems and software

Where to Start

Ask someone you trust to learn more about CMMI and report back to you. Ways to learn more include the SEI Web site, Introduction to CMMI training, and written publications.

Talk to others who have adopted CMMI to see how they did it. Early adopters that have agreed to talk to potential adopters are listed on the SEI Web site.

Participate in Discussion Groups and Bulletin Boards or attend a conference to learn from others who have adopted CMMI. A list of a few such forums is at www.sei.cmu.edu/cmmi/adoption/knowledge-exchange.html.

For More Information About CMMI

Go to CMMI Web site:

http://www.sei.cmu.edu/cmmi
http://seir.sei.cmu.edu

Contact SEI Customer Relations:

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