



Carnegie Mellon University
Software Engineering Institute

Process Maturity Profile of the Software Community 2001 Year End Update

March 2002

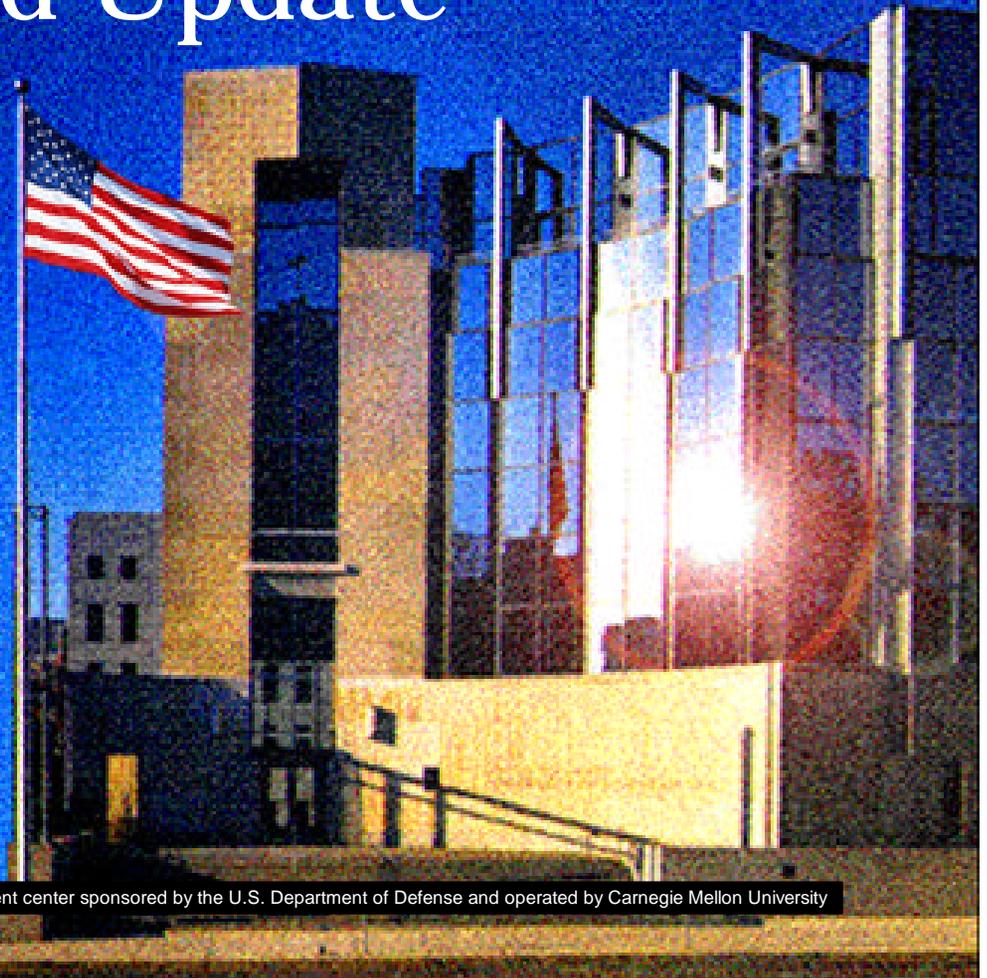
We could not have produced this report without the support of those organizations and lead assessors who have returned their appraisal information to the SEI.

Our gratitude goes to them for their continued cooperation with our data collection and analysis effort.

Software Engineering Measurement and Analysis Team

The Software Engineering Institute is a federally funded research and development center sponsored by the U.S. Department of Defense and operated by Carnegie Mellon University

© 2002 by Carnegie Mellon University





Outline

Introduction

Current Status

Community Trends

Organizational Trends

Summary



Introduction -1: Purpose and Source

Characterize the process maturity of the software community

This briefing uses information from reports of CMM[®] Based Appraisals for Internal Process Improvement (CBA IPIs) and Software Process Assessments (SPAs)

© CMM, Capability Maturity Model and Capability Maturity Modeling are registered in the U.S. Patent and Trademark Office.



Introduction -2: Data Description

CBA IPIs and SPAs conducted since 1987 through December 2001 and returned to the SEI by January 2002

- **2164 assessments**
 - 1676 CBA IPIs**
 - 488 SPAs**
- **1638 organizations**
- **456 participating companies**
- **427 reassessed organizations**
- **8925 projects**

Please refer to: **Terms Used in this Report on page 30**



Introduction -3: Report Contents

This briefing includes three primary sections:

- **Current Status**
 - **Snapshot of the software community based on the most recent assessment, since 1997, of reporting organizations**
- **Community Trends**
 - **Global distribution of assessments**
 - **Growth in the number of assessments performed**
 - **Shifts in the maturity profile over time**
- **Organizational Trends**
 - **Analysis of Key Process Area (KPA) satisfaction**
 - **Time to move up in maturity**



Current Status

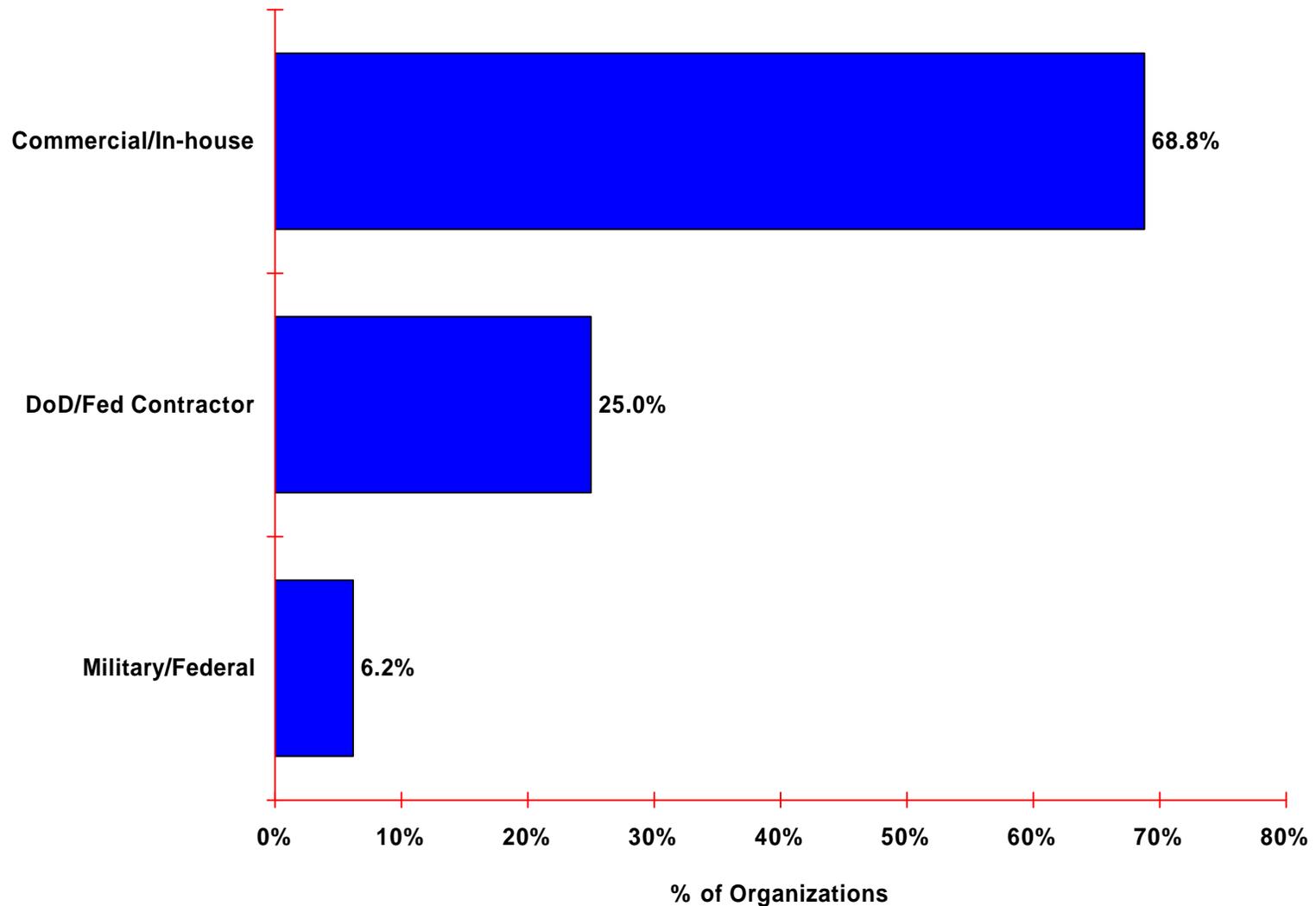
Assessments conducted from 1997 through December 2001

- **1158 organizations**
- **365 participating companies**
- **5624 projects**
- **38.0% offshore organizations**

Please refer to: **Terms Used in this Report on page 30**



Reporting Organization Types

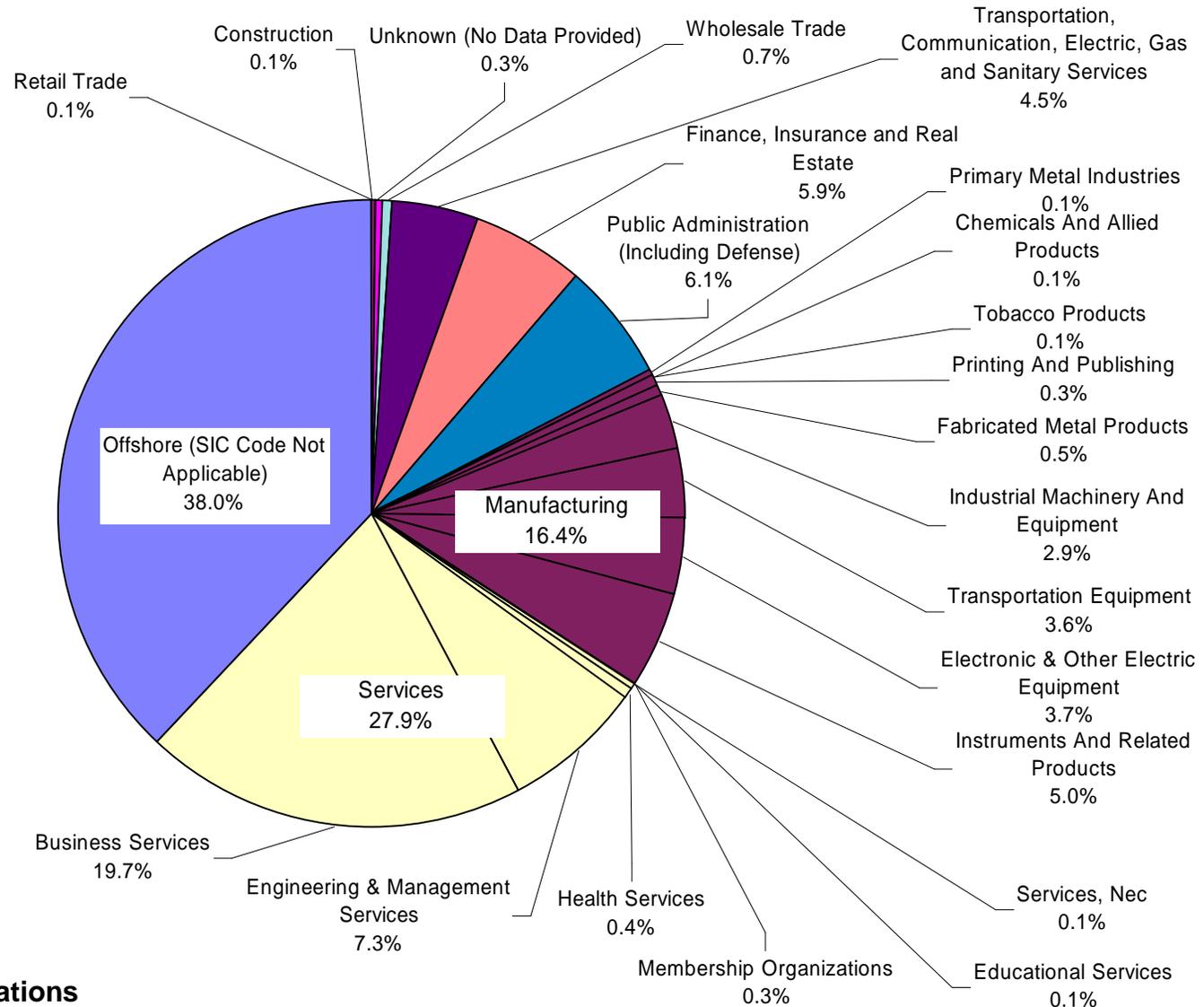


Based on 1158 organizations



Types of Organizations

Based on Primary Standard Industrial Classification (SIC) Code

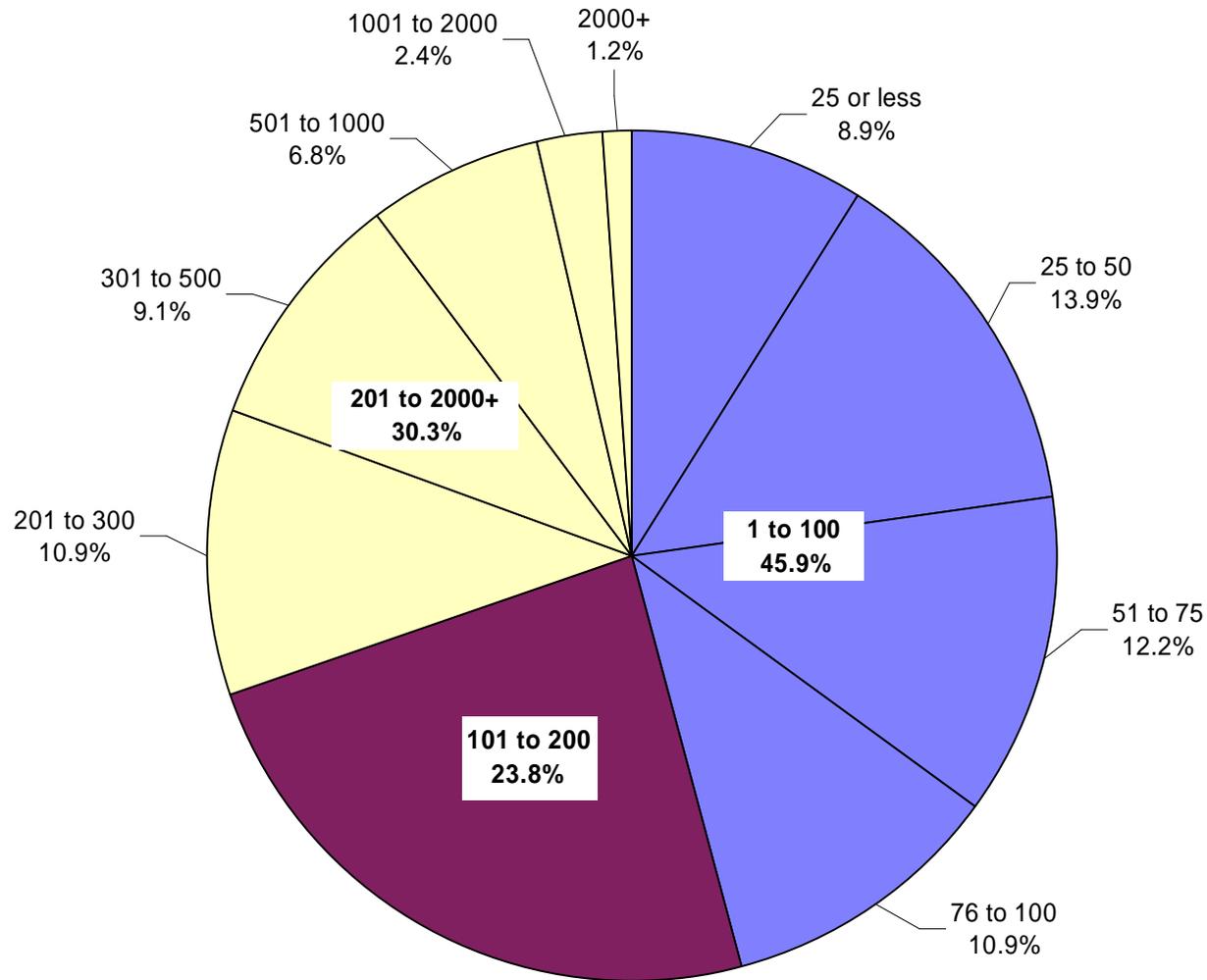


Based on 1158 organizations



Organization Size

Based on the total number of employees primarily engaged in software development/maintenance in the assessed organization

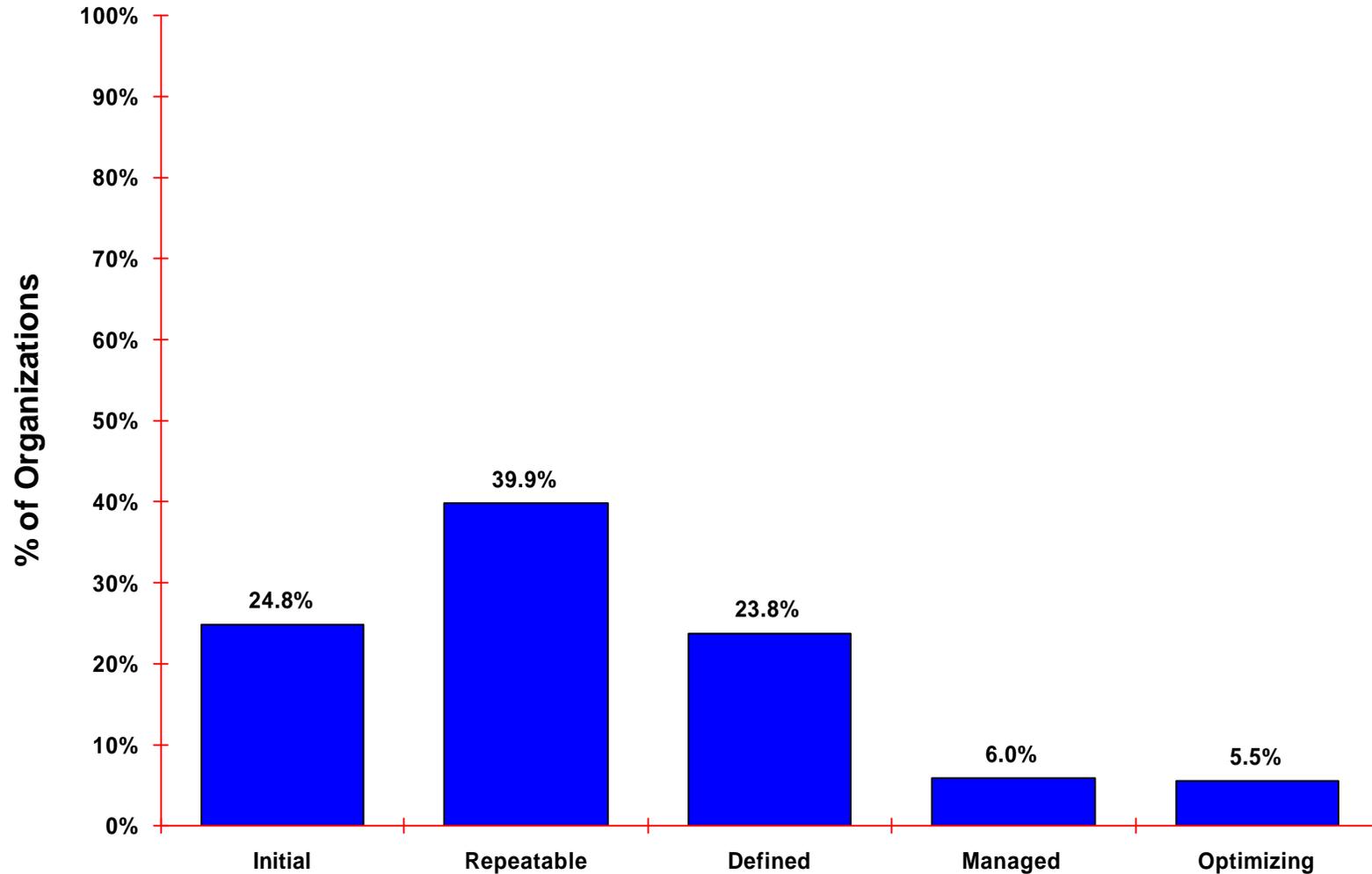


Based on 1104 organizations reporting size data



Organization Maturity Profile

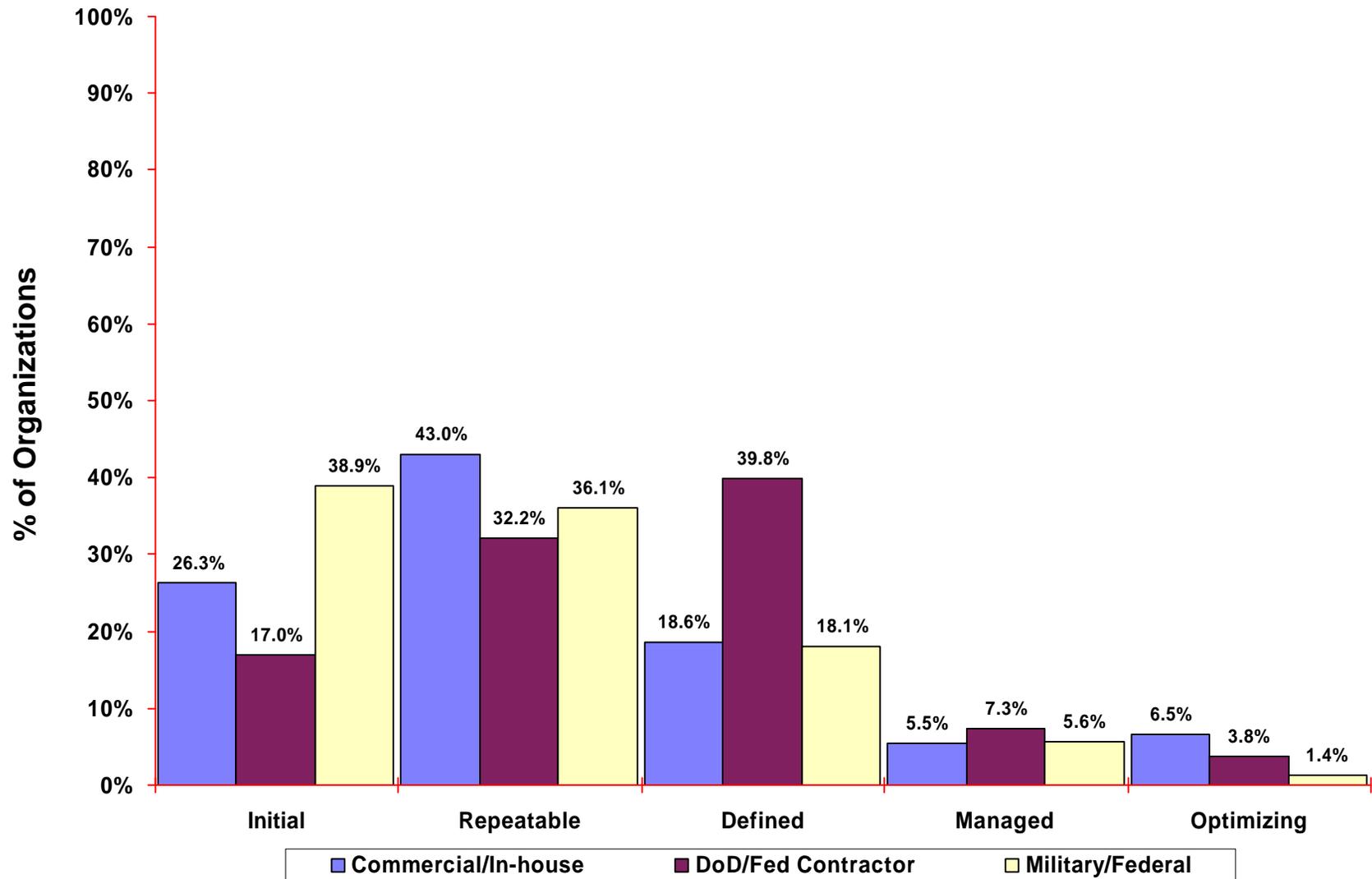
March 2002



Based on most recent assessment, since 1997, of 1158 organizations. For a perspective, please see page 19.



Maturity Profile by Organization Type

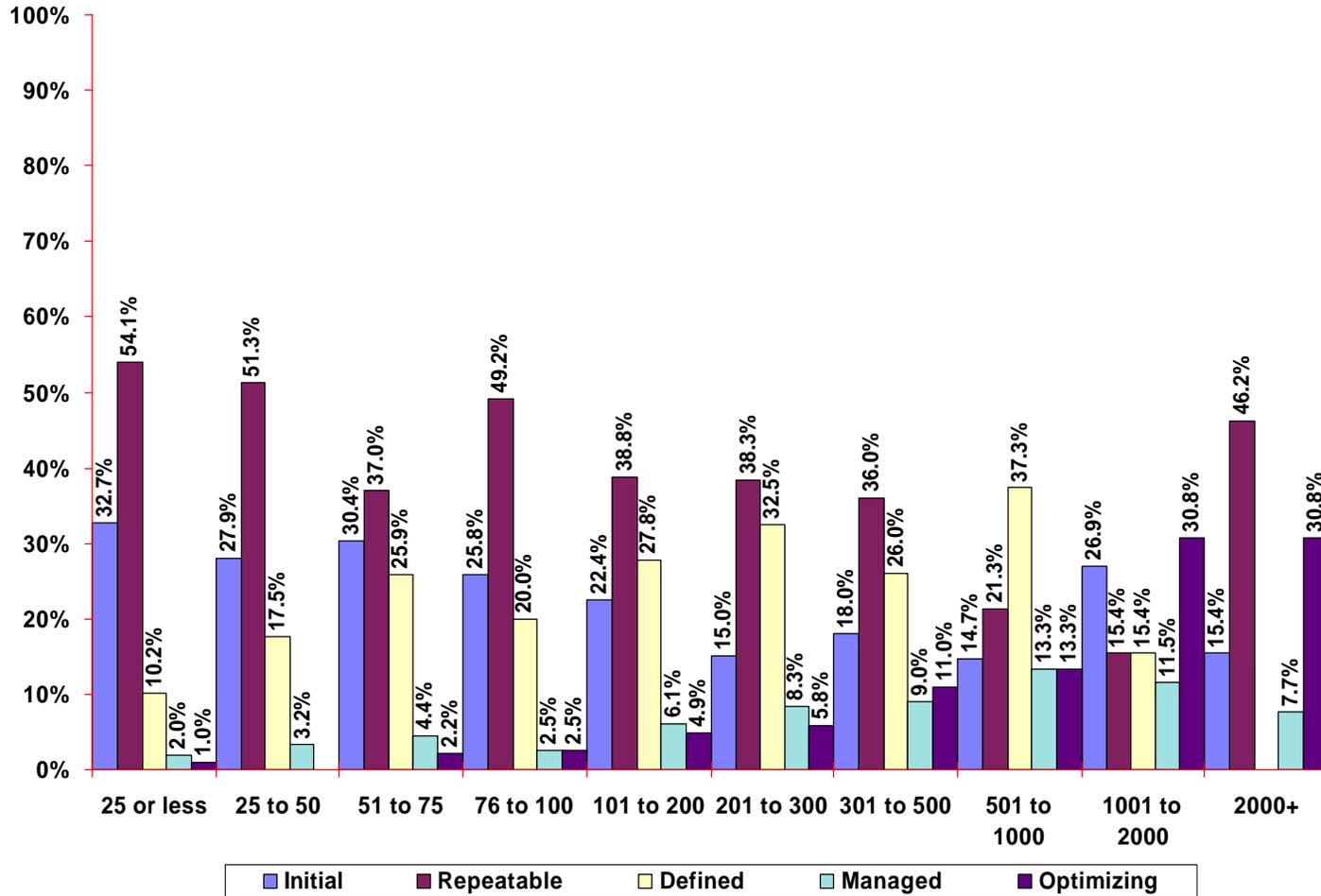


Based on most recent assessment, since 1997, of 1158 organizations



Maturity Profile by Organization Size

Based on the total number of employees primarily engaged in software development/maintenance in the assessed organization

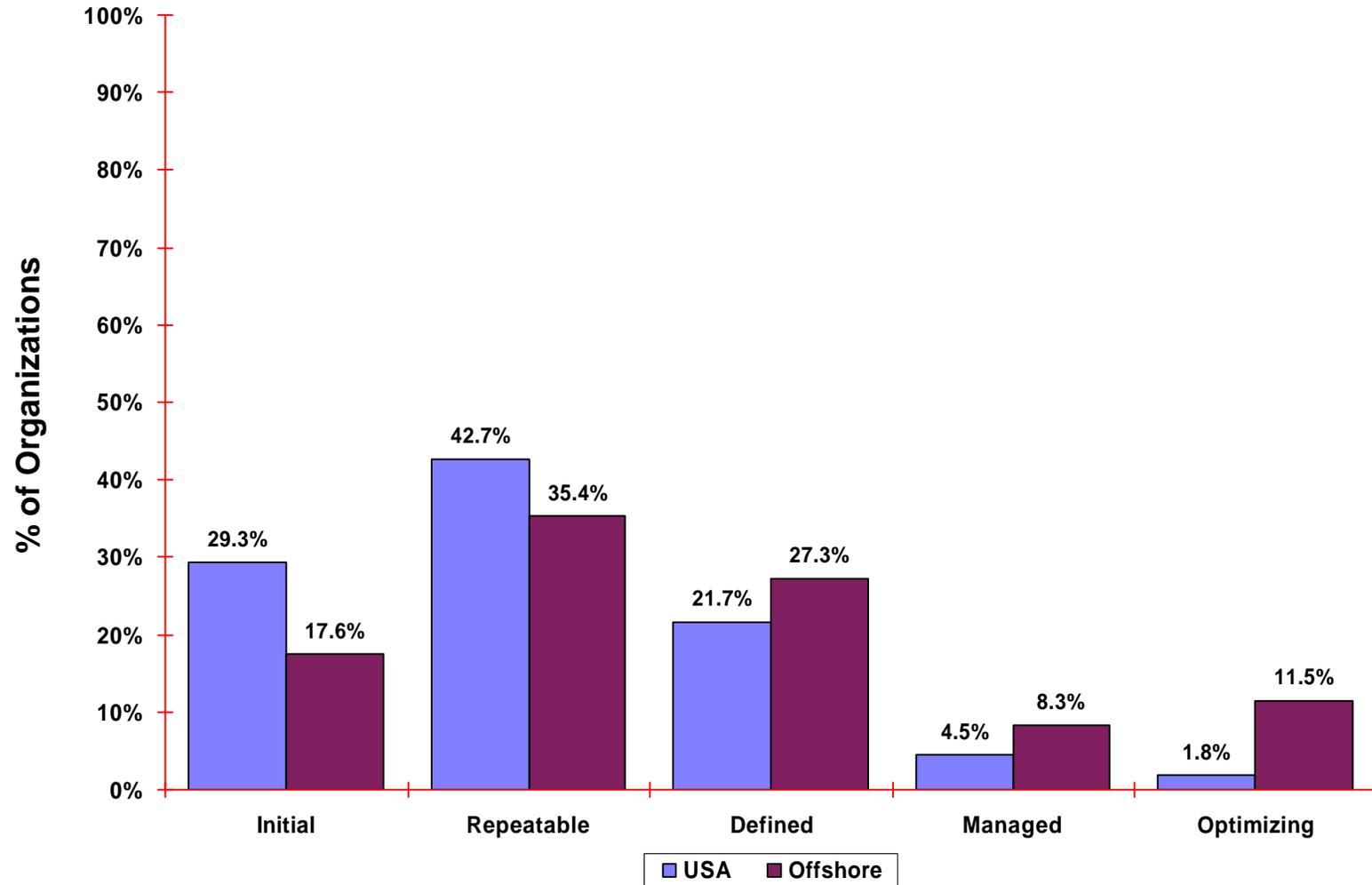


Based on 1104 organizations reporting size data

The 1001 to 2000 and 2000+ categories are of a small percentage which will inflate the maturity level bars. Please see page 9 and take this into account. The purpose of this chart is to indicate that all size categories contain most, if not all, maturity levels.



USA and Offshore Organization Maturity Profiles



Based on 714 U.S. organizations and 444 offshore organizations



Community Trends

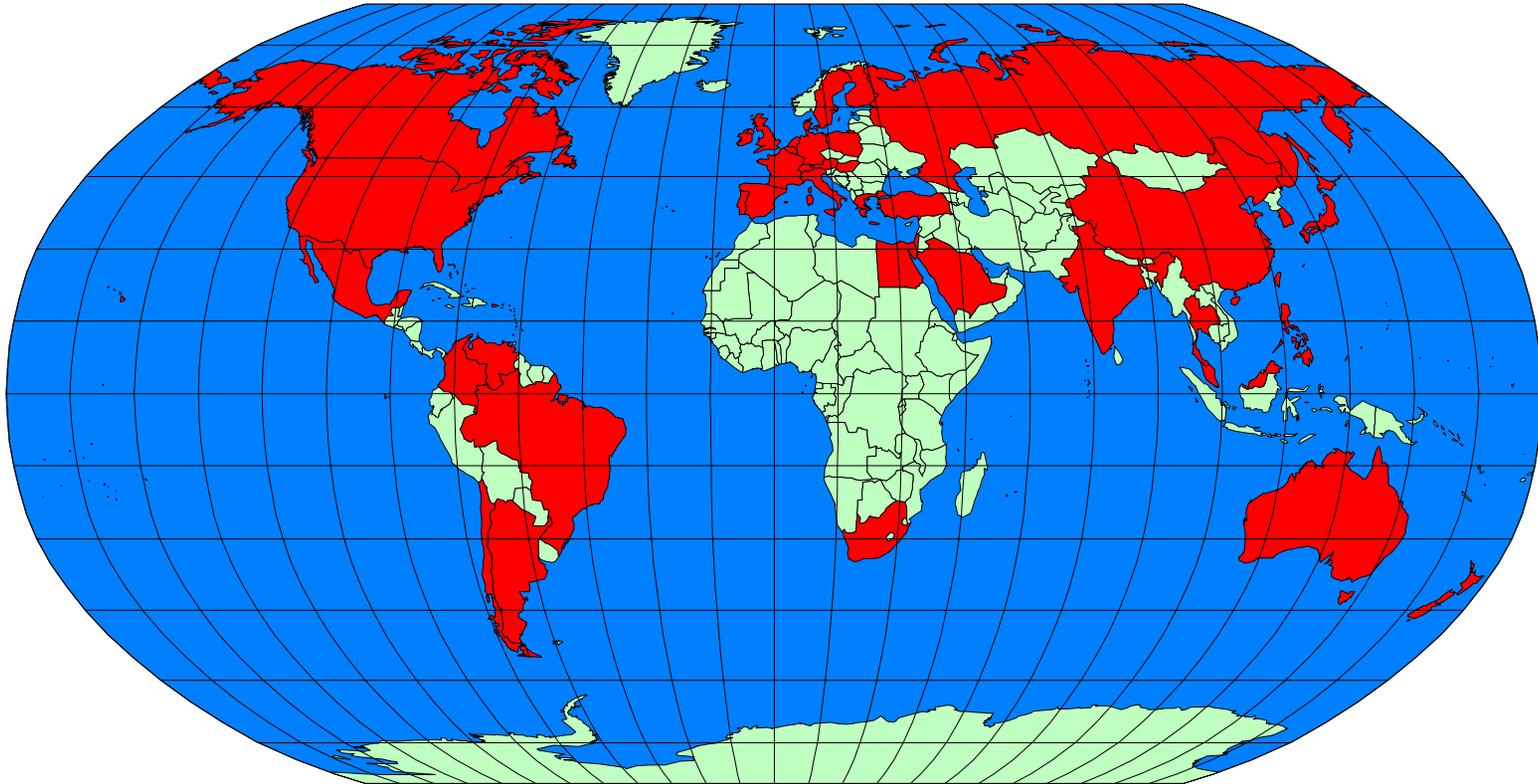
Assessments conducted from 1987 through December 2001

- **2164 assessments**
- **1638 organizations**
- **456 participating companies**
- **427 reassessed organizations**
- **8925 projects**

Please refer to: **Terms Used in this Report on page 30**



Countries where Assessments have been Performed and Reported to the SEI



Argentina	Australia	Austria	Barbados	Belgium	Brazil	Canada	Chile
China	Colombia	Denmark	Egypt	Finland	France	Germany	Greece
Hong Kong	Hungary	India	Ireland	Israel	Italy	Japan	Korea, Republic of
Malaysia	Mexico	Netherlands	New Zealand	Philippines	Poland	Portugal	Puerto Rico
Russia	Saudi Arabia	Singapore	South Africa	Spain	Sweden	Switzerland	Taiwan
Thailand	Turkey	United Kingdom	United States	Venezuela			



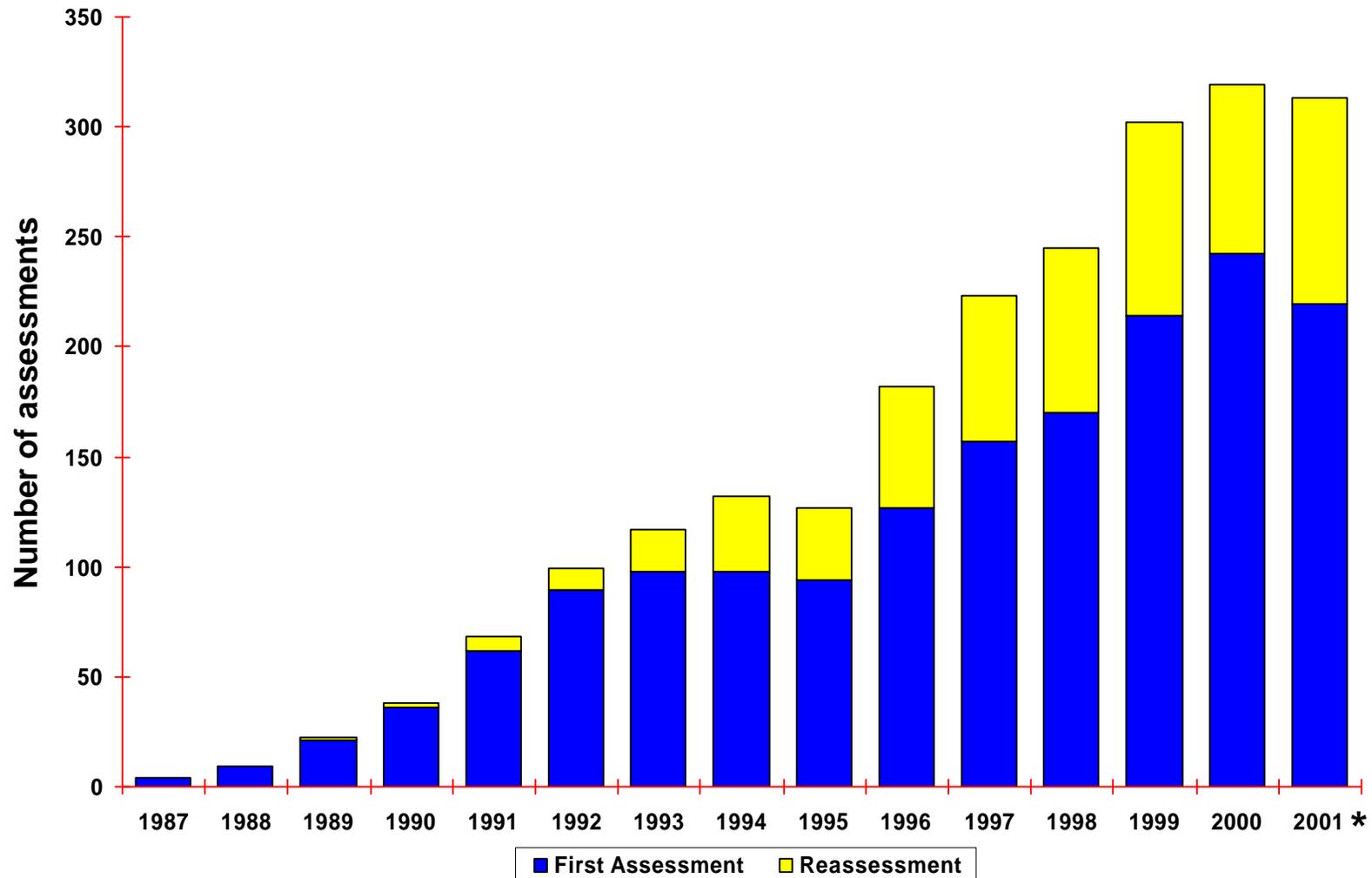
Number of Assessments and Maturity Levels Reported to the SEI by Country

Country	Number of Assessments Reported	Maturity Level 1 Reported	Maturity Level 2 Reported	Maturity Level 3 Reported	Maturity Level 4 Reported	Maturity Level 5 Reported	Country	Number of Assessments Reported	Maturity Level 1 Reported	Maturity Level 2 Reported	Maturity Level 3 Reported	Maturity Level 4 Reported	Maturity Level 5 Reported
Argentina	Less Than 10						Japan	46	Yes	Yes	Yes	No	Yes
Australia	27	Yes	Yes	Yes	No	No	Korea, Republic of	Less Than 10					
Austria	Less Than 10						Malaysia	Less Than 10					
Barbados	Less Than 10						Mexico	Less Than 10					
Belgium	Less Than 10						Netherlands	12	Yes	Yes	Yes	No	No
Brazil	15	Yes	Yes	Yes	No	No	New Zealand	Less Than 10					
Canada	47	Yes	Yes	Yes	No	Yes	Philippines	Less Than 10					
Chile	Less Than 10						Poland	Less Than 10					
China	18	No	Yes	Yes	No	Yes	Portugal	Less Than 10					
Colombia	Less Than 10						Puerto Rico	Less Than 10					
Denmark	Less Than 10						Russia	Less Than 10					
Egypt	Less Than 10						Saudi Arabia	Less Than 10					
Finland	Less Than 10						Singapore	15	Yes	Yes	Yes	No	Yes
France	103	Yes	Yes	Yes	Yes	No	South Africa	Less Than 10					
Germany	21	Yes	Yes	Yes	No	No	Spain	Less Than 10					
Greece	Less Than 10						Sweden	Less Than 10					
Hong Kong	Less Than 10						Switzerland	Less Than 10					
Hungary	Less Than 10						Taiwan	Less Than 10					
India	153	Yes	Yes	Yes	Yes	Yes	Thailand	Less Than 10					
Ireland	Less Than 10						Turkey	Less Than 10					
Israel	27	Yes	Yes	Yes	No	No	United Kingdom	103	Yes	Yes	Yes	No	No
Italy	21	Yes	Yes	Yes	No	No	United States	1498	Yes	Yes	Yes	Yes	Yes
							Venezuela	Less Than 10					

Please note that this information, as with all information in this report, is based on what assessments have been sent to the SEI. This does not necessarily mean every assessment performed is reported to the SEI. Of those countries with more than 10 assessments reported to the SEI, most, if not all, maturity levels are represented. A further breakdown is not possible without compromising confidentiality. In order to provide this breakdown, every assessment performed should be reported to the SEI. Please make sure the assessment artifacts reported are translated into English for proper processing.



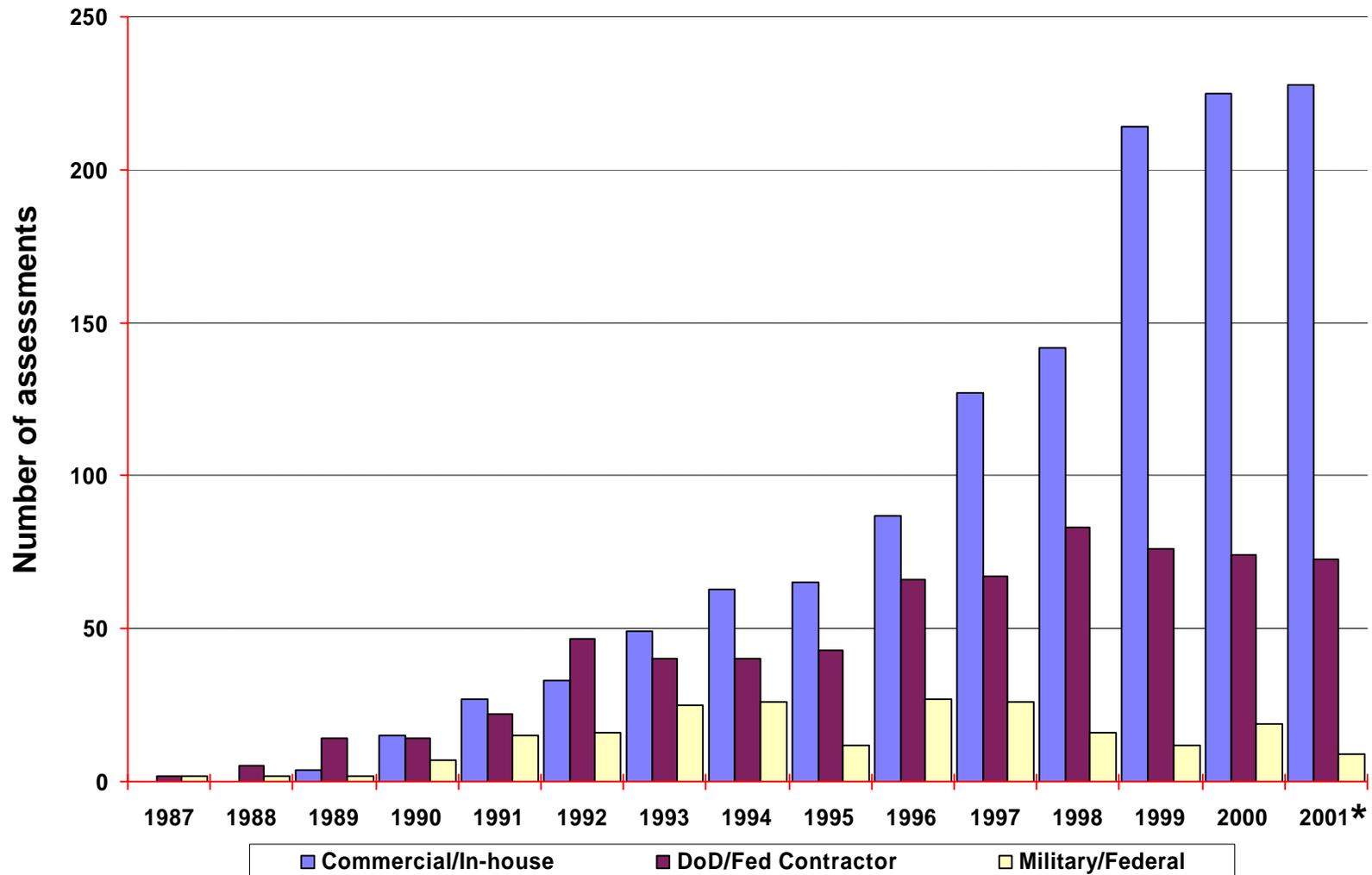
Number of Assessments Reported to the SEI by Year



Based on 2164 assessments conducted through Dec 2001 and reported to the SEI by Jan 2002 *



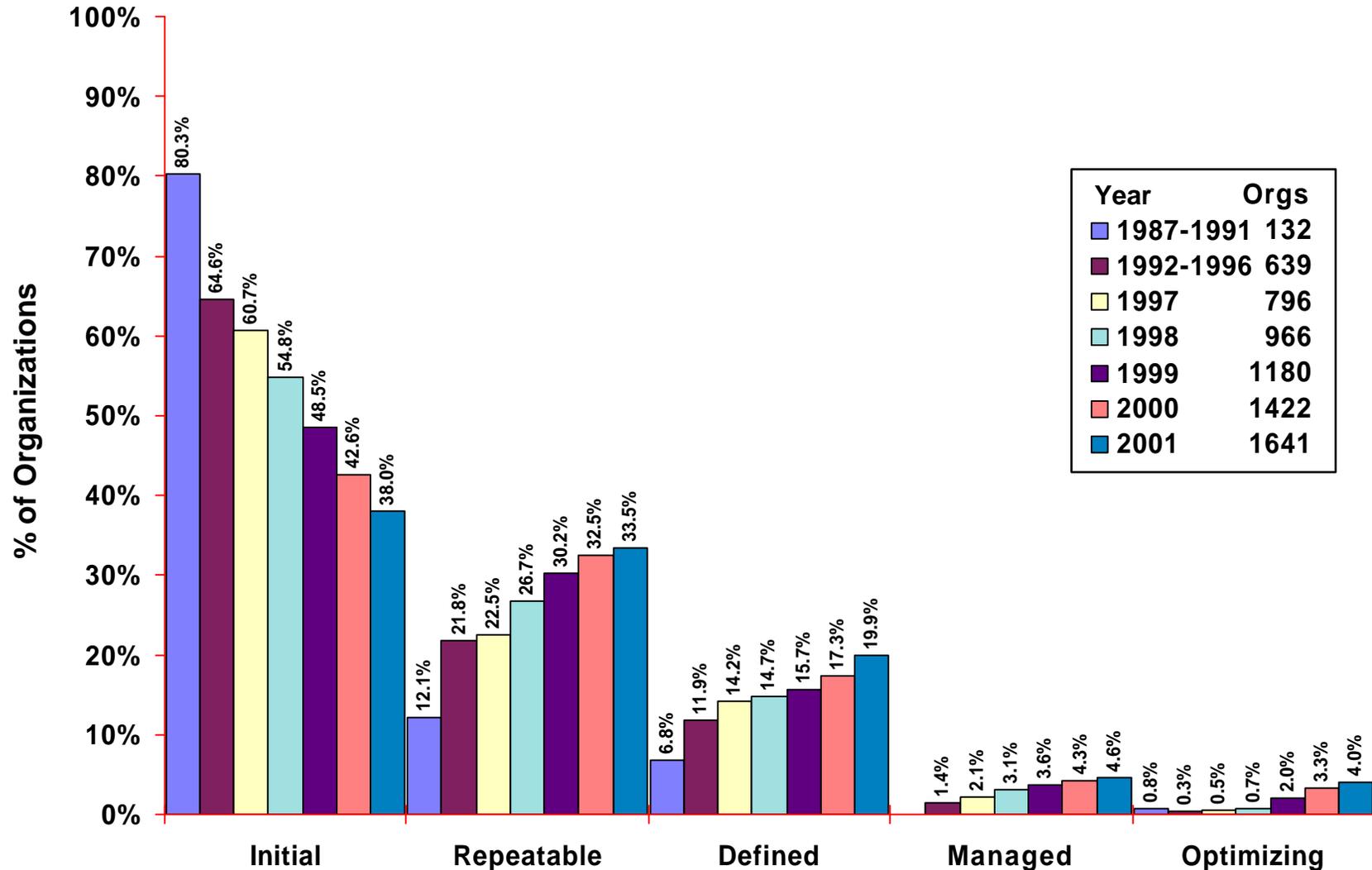
Number of Assessments Reported by Organization Type and Year



Based on 2164 assessments conducted through Dec 2001 and reported to the SEI by Jan 2002 *



Trends in the Community Maturity Profile



Based on a cumulative view of the most recent assessments of organizations up through the year indicated. This accounts for the difference from the figures on page 10.



Organizational Trends

Assessments conducted through December 2001

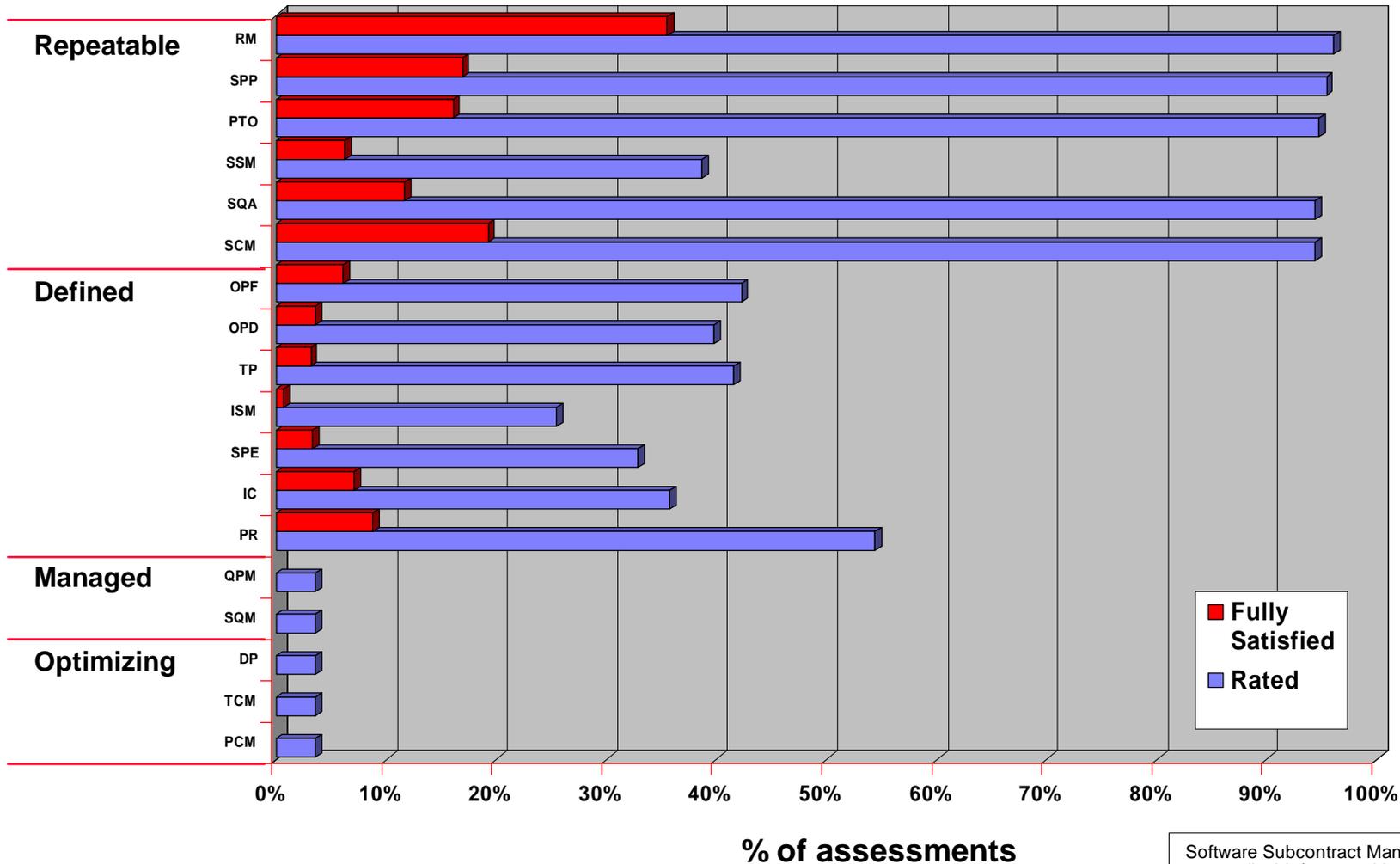
- **1129 Key Process Area (KPA) profiles**
 - **satisfaction of KPAs by maturity level for organizations assessed at levels 1 and 2**
- **427 reassessed organizations**
 - **accounting for 960 assessments**
 - **although some organizations conducted multiple reassessments, only the first and latest assessments were used in creating the charts on pages 23 & 24**

Please refer to: **Terms Used in this Report on page 30**



Key Process Area Profiles -1

Organizations Assessed at Level 1



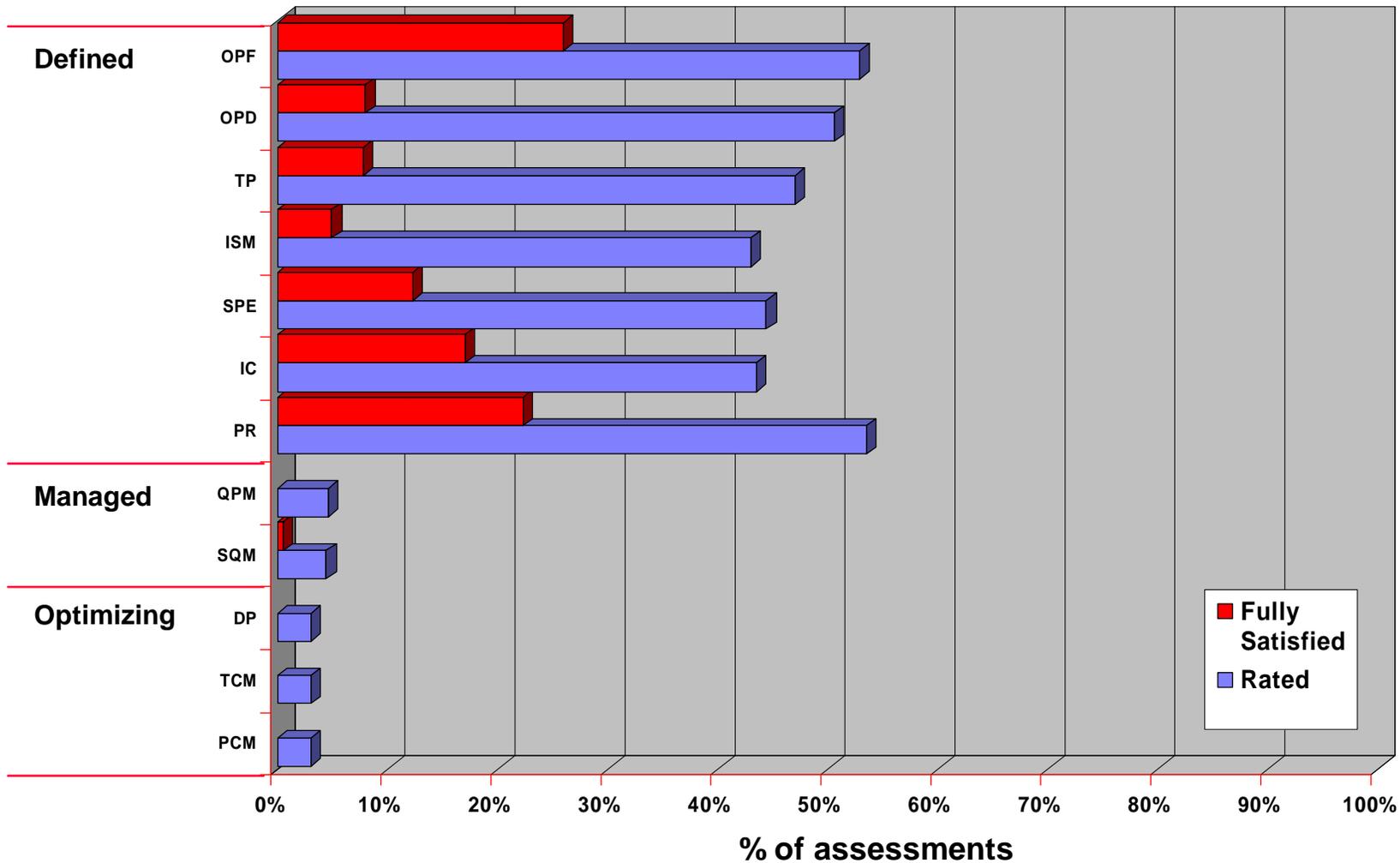
Software Subcontract Management (SSM) is not applicable/not rated in many assessments. Please take that into account when interpreting its Fully Satisfied rating.

Based on 478 IPI assessments



Key Process Area Profiles -2

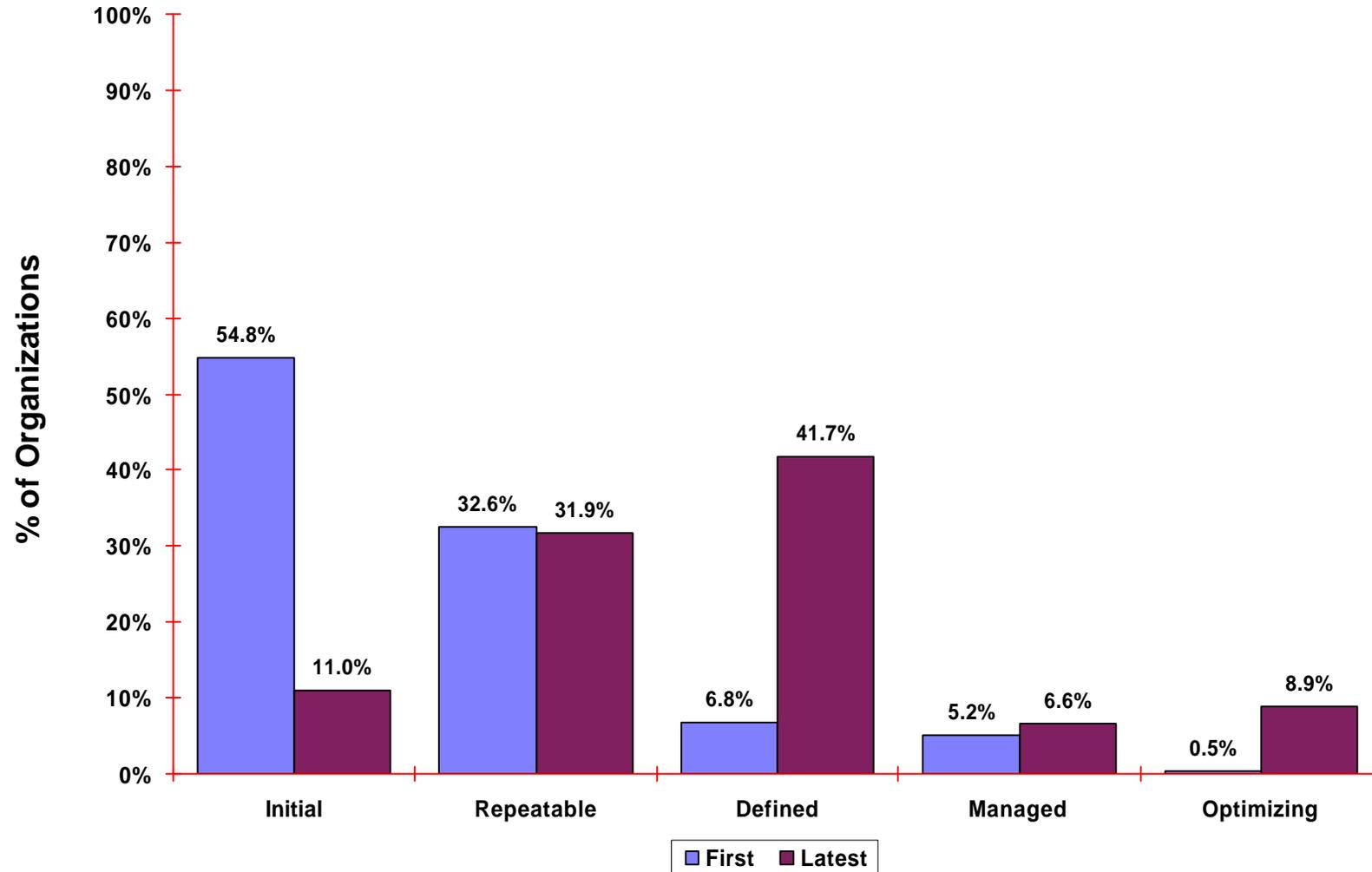
Organizations Assessed at Level 2



Based on 651 IPI assessments



Maturity Level of First and Latest Assessments

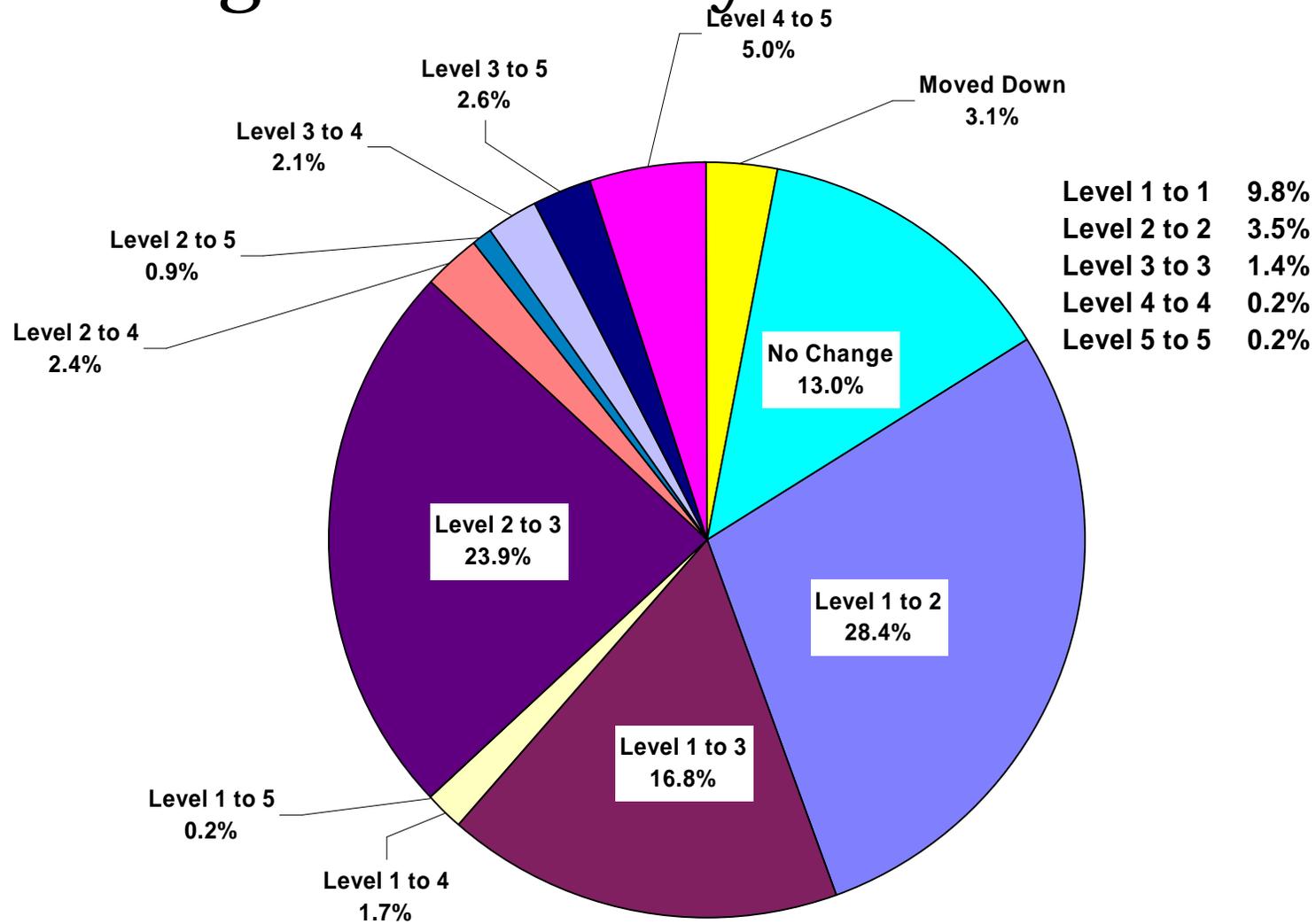


Based on 427 reassessed organizations using their first and latest assessment



Reassessments

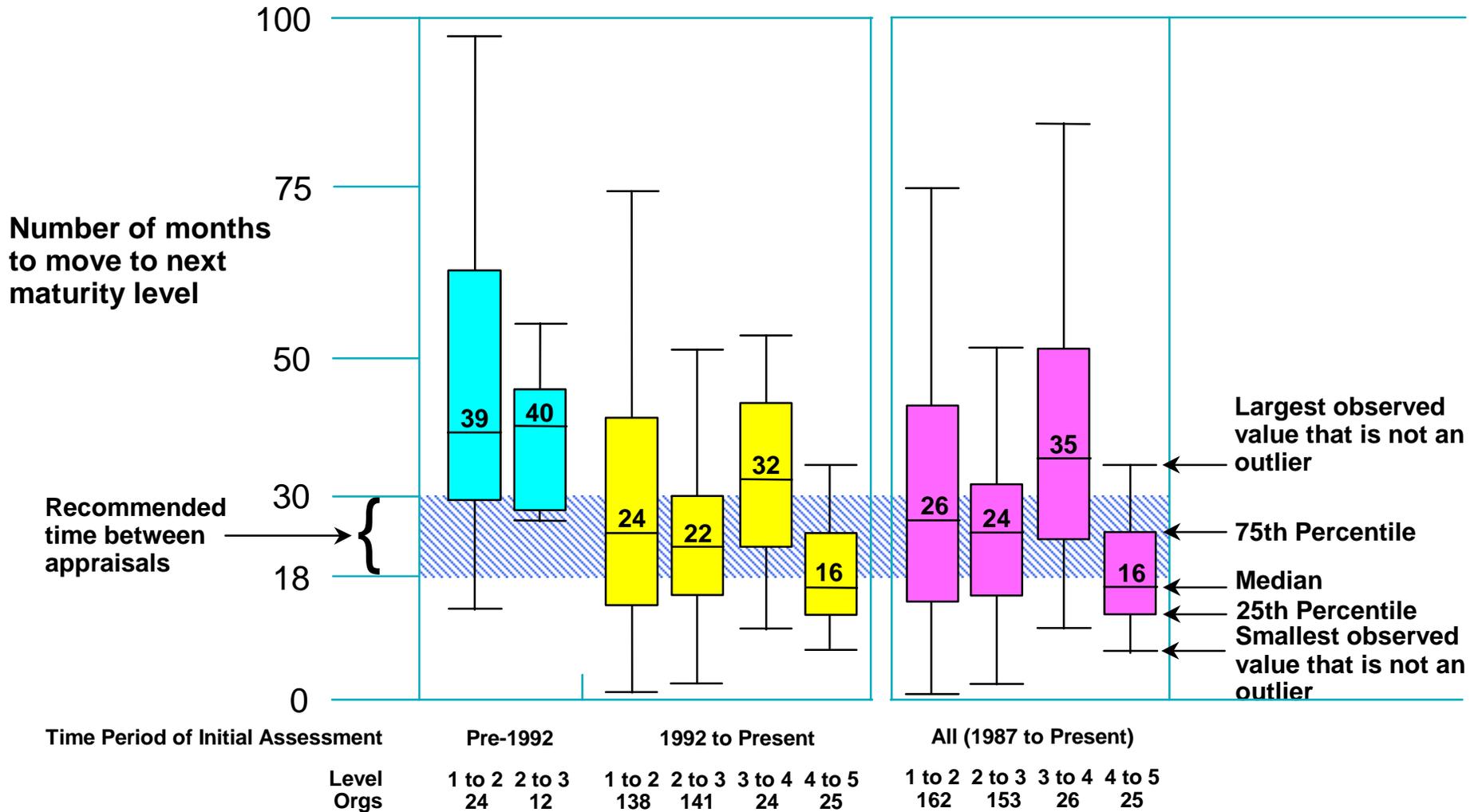
Change in Maturity Level



Based on 427 reassessed organizations using their first and latest assessment



Time to Move Up





Maturity Summary - 1

Current Status

Increasing proportion of commercial and in-house organizations

Of U.S. organizations, the services and manufacturing industries are conducting the most software process assessments

Nearly half of the organizations reporting size have 100 or less software personnel



Maturity Summary - 2

Community Trends

Overall community profile continues to shift towards higher maturity

Trend towards higher maturity profile for offshore organizations compared to U.S. organizations continues



Maturity Summary - 3 Organizational Trends

Software Quality Assurance is the least frequently satisfied level 2 KPA among organizations* assessed at level 1

Integrated Software Management is the least frequently satisfied level 3 KPA among organizations* assessed at level 2

Higher maturity has been reached among those organizations reporting reassessments

***Adjusted for number of organizations rating the KPA.**



Maturity Summary - 4

Organizational Trends (continued)

For organizations that began their CMM-based SPI effort in 1992 or later, the median time to move from:

- **maturity level 1 to 2 is 24 months**
- **maturity level 2 to 3 is 22 months**
- **maturity level 3 to 4 is 32 months**
- **maturity level 4 to 5 is 16 months**



Terms Used in this Report

- Assessments** - The assessment methods used in this report are the **Software Process Assessment (SPA)** and **CMM-Based Appraisal for Internal Process Improvement (CBA IPI)**. We do request and receive other **Software CMM[®]-based appraisals** such as **Software Capability Evaluations (SCE)** and **Interim Profiles**. As our sampling size of these other methods increase, they will be reported here.
- Company** - **Parent of the organization**
A company can be a commercial or non-commercial firm, for-profit or not for-profit business, a research and development unit, a higher education unit, a government agency, or branch of service, etc.
- Organization** - **Appraised entity**
The organization unit to which the appraisal results apply. An appraised entity may be any portion of an organization including an entire company, a selected business unit, units supporting a particular product line or service, etc..
- Offshore** - **An organization whose geographic location is not within the United States**. The parent of the organization may or may not be based within the United States.



Feedback & Questions Welcome

We are always interested in improving the maturity profile to serve you better. To do this, we need to know a little more about you. Please let us know

- 1. How you use the information in this report**
- 2. What additional information would you like to see presented in the maturity profile report**
- 3. If there is a problem in your supplying us with the required data to create the information you would like to see**

As always, if you have questions or comments, we would appreciate hearing them.

Please respond to: **PAIS**
Software Engineering Institute
4500 Fifth Avenue
Pittsburgh, PA 15213

or E-Mail to: **pais@sei.cmu.edu**

Include: **Your Name**
Address
Phone
Fax
E-Mail



Submit Your Appraisal Data

Visit our Web site for forms used to submit data and for future maturity profile reports:

<http://www.sei.cmu.edu/sema/packet.html>

Send the forms and your appraisal data to

PAIS

Software Engineering Institute

4500 Fifth Ave.

Pittsburgh, PA 15213



A Web Based Interactive Maturity Profile is available through the Software Engineering Information Repository

<http://seir.sei.cmu.edu>



- **Create a particular Maturity Profile chart for a more specific segment within the software engineering community**
- **The Interactive Maturity Profile contains all releases of the Maturity Profile. Of the charts within a Maturity Profile, fourteen can be customized.**
- **The segments are from our seven categories (Commercial, In-House, DoD or Federal Contractor, etc.) or from the Standard Industrial Classification Code.**
- **Best of all a chart can be enlarged and/or printed once you create it.**



Contacts for General SEI Information

SEI Customer Relations (412) 268-5800
SEI FAX number (412) 268-5758

Internet Address
customer-relations@sei.cmu.edu

Mailing Address
Customer Relations
Software Engineering Institute
Carnegie Mellon University
Pittsburgh, PA 15213-3890