

CMMI[®]

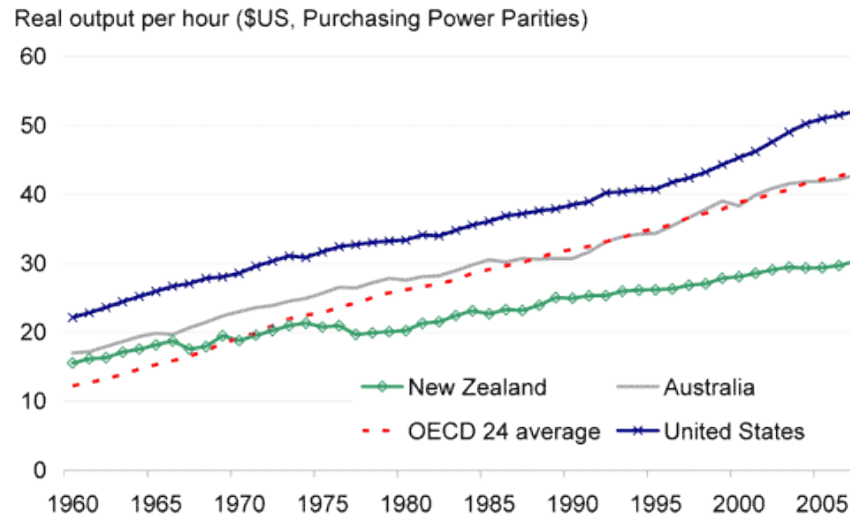
A new path to quality & productivity in New Zealand

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Avaria Limited

Productivity

“Productivity is New Zealand's biggest economic challenge”

The Treasury, November 2010

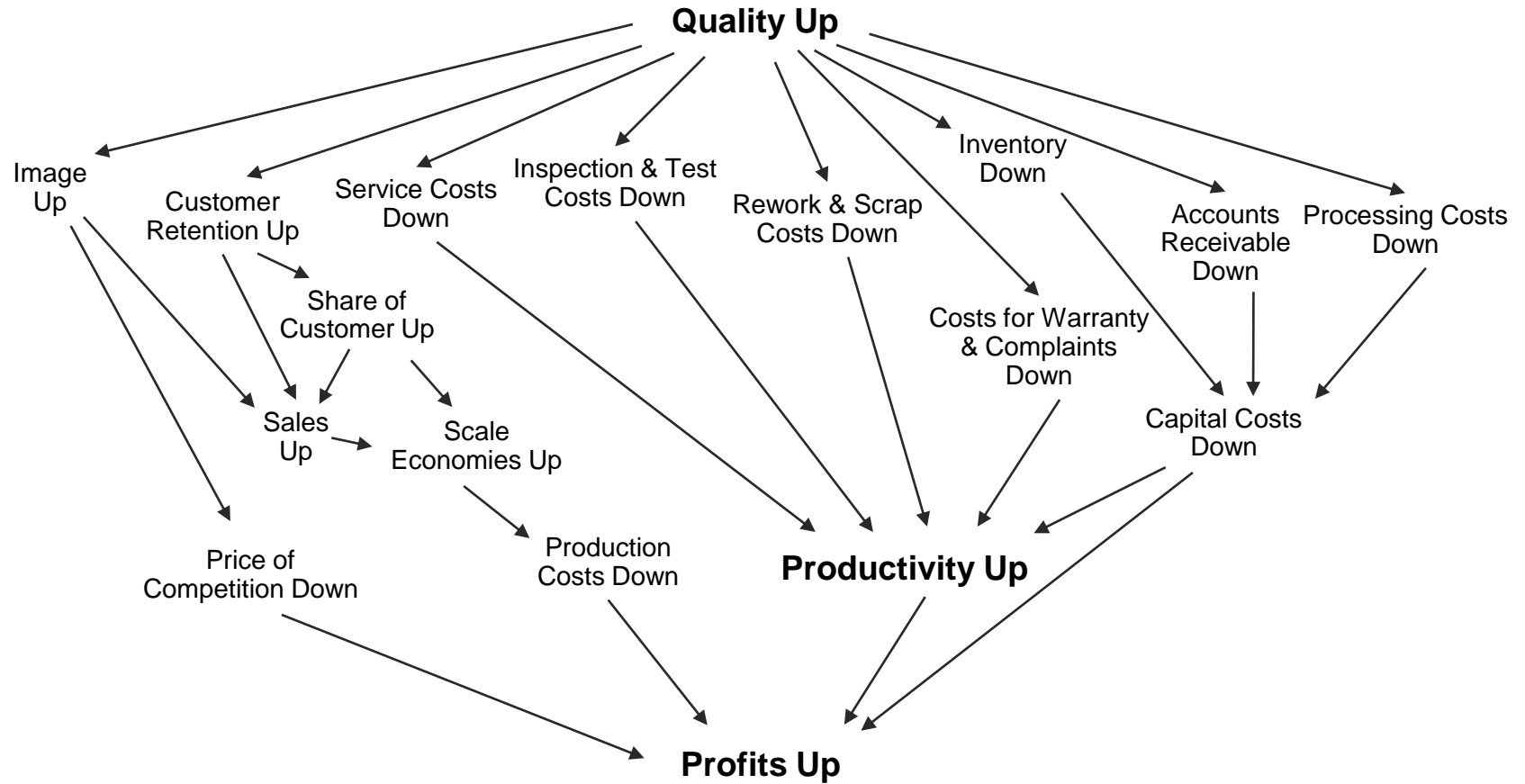


Agenda

- Productivity, quality and process
- History and context for CMMI
- CMMI architecture and content overview
- Benefits



Productivity & Quality



Gummesson, E. (1998). Productivity, Quality and Relationship Marketing in Service. International Journal of Contemporary Hospitality Management, 10 (1) , pp. 4-15.)

Quality & Process



The Process Management Premise

- The quality of products and services are highly influenced by the quality of the processes used to acquire, develop, and maintain them
- ↓
- Process improvement increases product and service quality
- ↓
- Business objectives can be achieved when process improvement outcomes are aligned with business goals

To achieve new business objectives

Symptoms

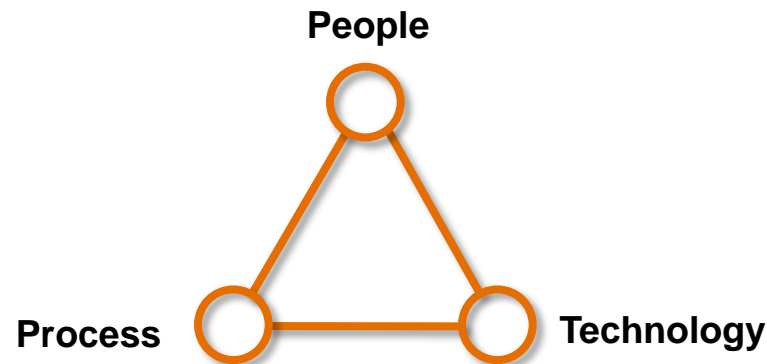


- Poor communication between stakeholders
- Problems with third-party suppliers
- Lack of documented services, methods, plans, requirements, and designs
- Difficulty managing virtual or geographically distributed teams
- Problems with version control and the integrity of materials
- Development or service teams overwhelmed with issues
- Over-dependence on key personnel, inflexible resourcing and inability to scale
- Projects and services are late, have trouble closing and making budget/money
- Lack of visibility of performance, progress and quality
- Repeated mistakes
- Failure to deliver to customer needs and expectations
- Damaged relationships and lost business value

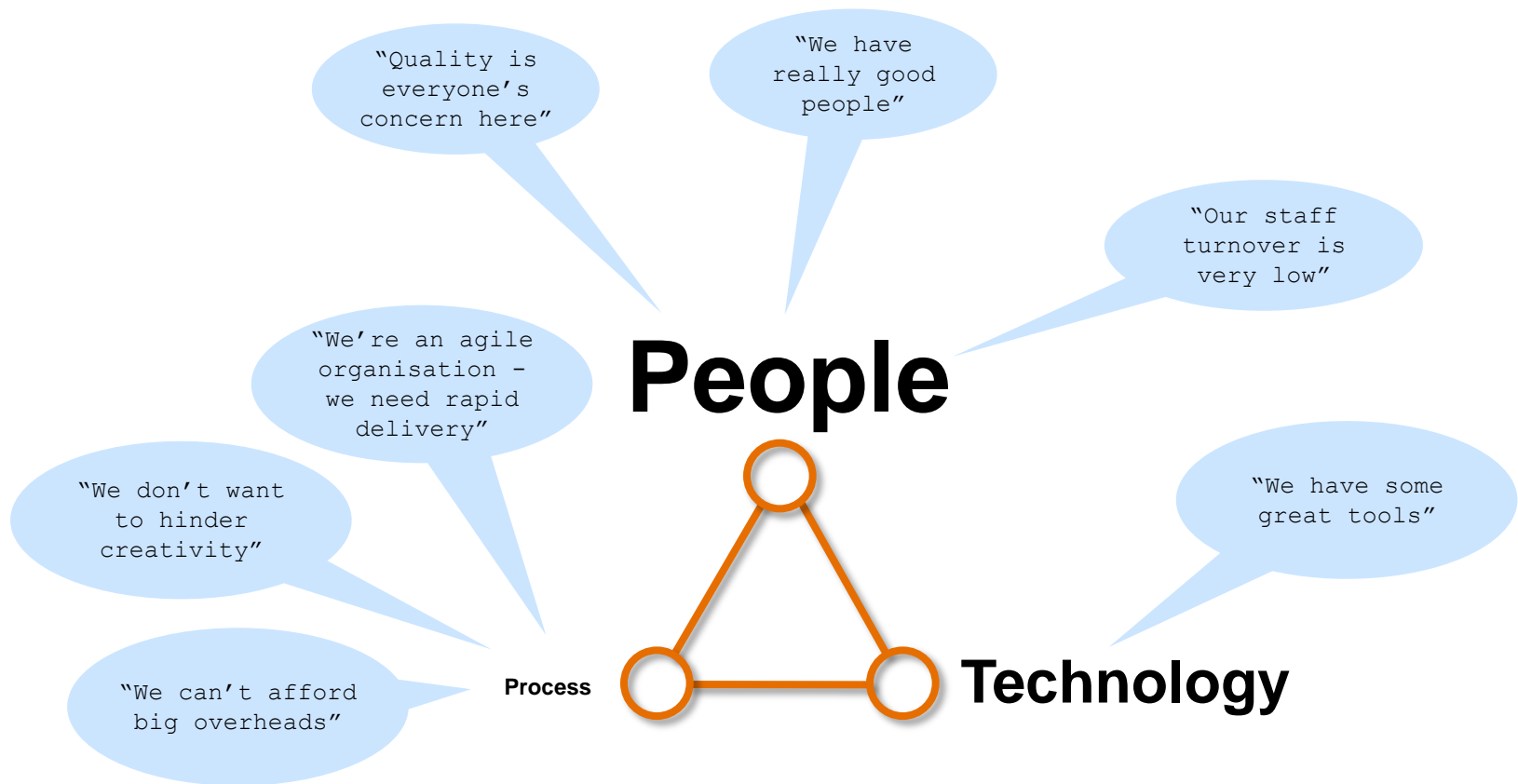
Points of Influence

People, **Process** and **Technology** determine the cost, cycle time and quality of products and services.

- People – talent operating in organisational structures
- Process – your methods and way of working
- Technology – systems and tools that improve efficiency and prevent mistakes



Common Characteristics



The challenges of buried process

- Business value - how can you own it?
- Scalability - how can you achieve it?
- Capability - how can you prove it and improve it?
- Technology - how can you sensibly invest in and apply it?



A Process Model



Capability Maturity Model Integration® (CMMI®)

- A collection of practices that have proven value
- The information is structured & organised
- A tool for measuring the current state and appraising progress
- Non-prescriptive and requires interpretation
 - › Lifecycle?
 - › Methodology?
 - › Standard?
 - › Process description?
 - › Technology dependent?
 - › Silver-bullet?

A framework for business improvement

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A Short History of CMMI₁



Capability Maturity Models

- Early 1980's - US Federal Government cannot distinguish between competing bids for software development
- 1984 - Carnegie Mellon University Software Engineering Institute (SEI) receives Federal contract (DoD funded)
- 1987 - Watts S. Humphrey authors the first CMM, "A Method for Assessing the Software Engineering Capability of Contractors"
- 1991 - SW-CMM v1.0 released

A Short History of CMMI₂



CMMI Project

- 1997 - Project initiated to address the proliferation of CMMs and improve usability beyond 'software'
The 'I' in CMMI refers to 'integration' - combined source models for software, systems engineering and integrated teaming
- 2001 - CMMI v1.1 released
- 2006 - CMMI v1.2
- 2007 - CMMI for Acquisition
- 2009 - CMMI for Services
- 2010 - CMMI v1.3

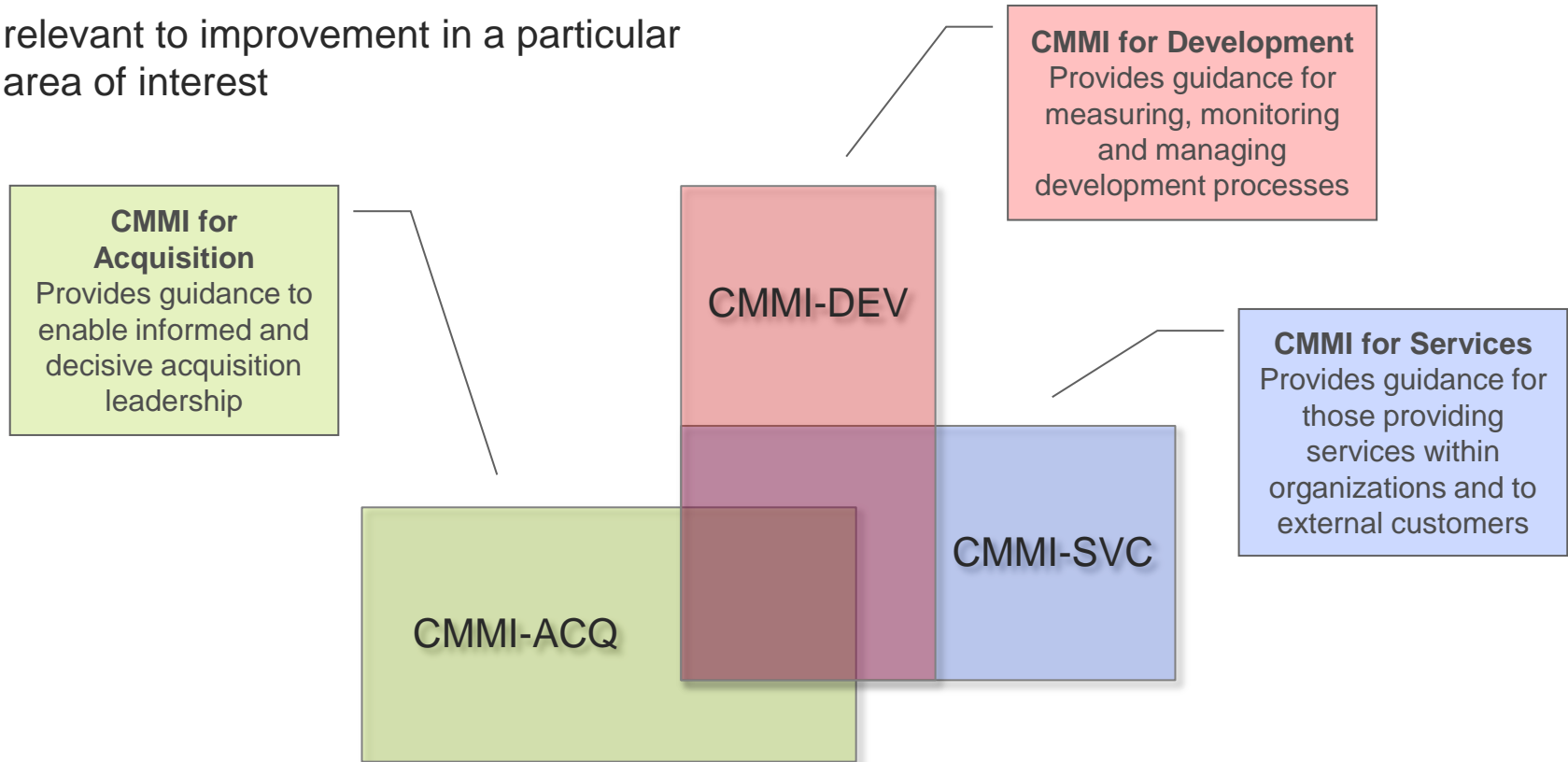
The CMMI Product Suite

The complete set of products developed around the CMMI concept.

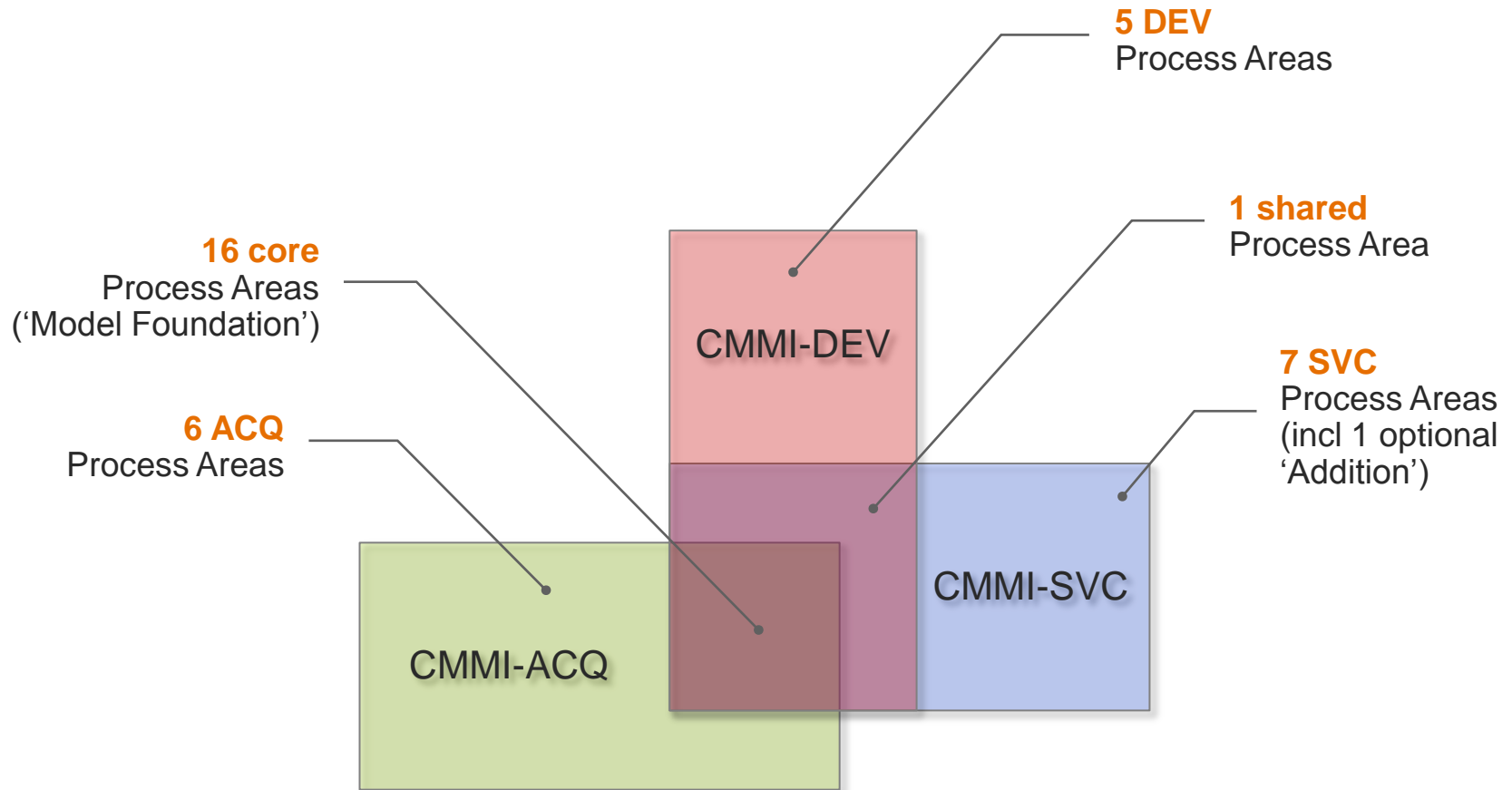
- The CMMI framework
 - › Common elements of the current CMMI models
 - › Rules and methods for generating models
- Models
- Appraisal methods and materials
- Training

The CMMI Product - Constellations₁

A subset of the CMMI Product Suite relevant to improvement in a particular area of interest

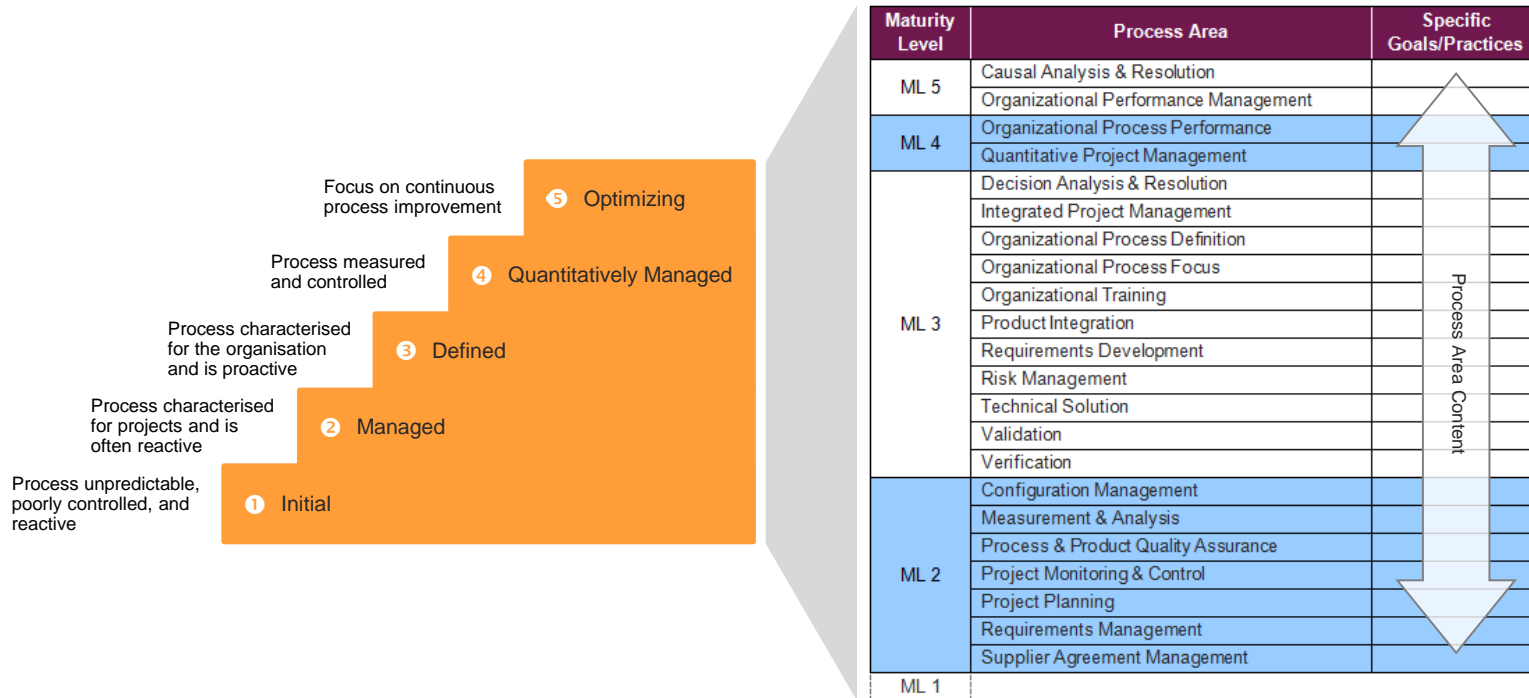


The CMMI Product - Constellations₂



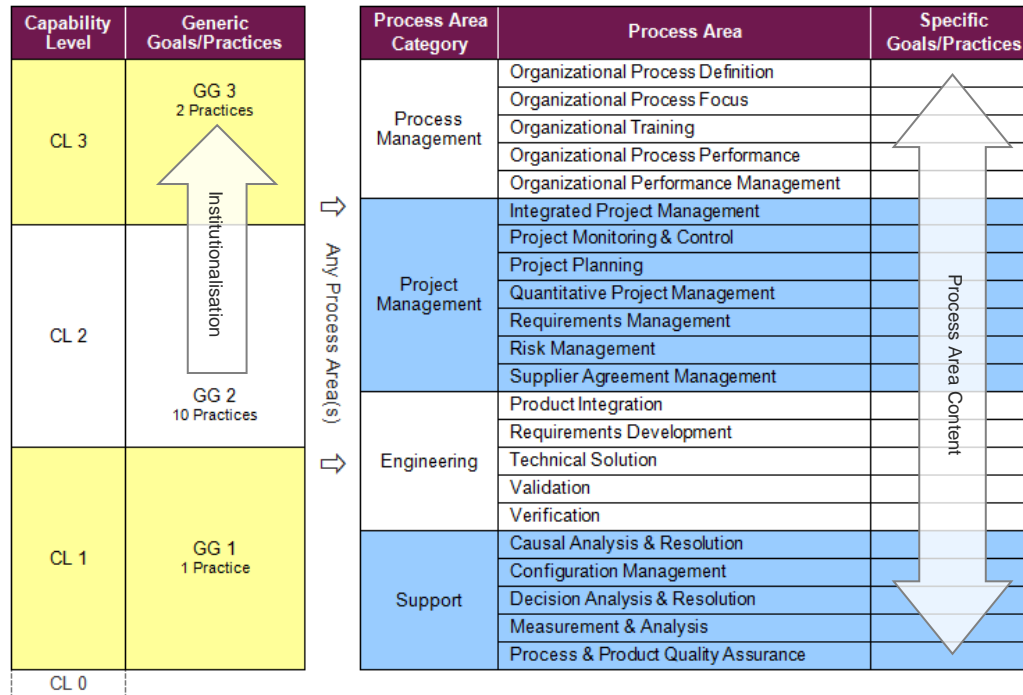
Two Improvement 'Views' (CMMI- DEV)

1) Staged Representation



Two Improvement 'Views' (CMMI-DEV)

2) Continuous Representation



Process Area Overview: CMMI-DEV

		Process Management	Project Management	Engineering	Support
High Maturity	ML 5	<ul style="list-style-type: none"> Organizational Performance Management 			<ul style="list-style-type: none"> Causal Analysis & Resolution
	ML 4	<ul style="list-style-type: none"> Organizational Process Performance 	<ul style="list-style-type: none"> Quantitative Project Management 		
ML 3		<ul style="list-style-type: none"> Organizational Process Focus Organizational Process Definition Organizational Training 	<ul style="list-style-type: none"> Integrated Project Management Risk Management 	<ul style="list-style-type: none"> Requirements Development Technical Solution Product Integration Validation Verification 	<ul style="list-style-type: none"> Decision Analysis & Resolution
ML 2			<ul style="list-style-type: none"> Project Planning Project Monitoring & Control Requirements Management Supplier Agreement Management 		<ul style="list-style-type: none"> Configuration Management Measurement & Analysis Process & Product Quality Assurance

Process Area Overview: CMMI-SVC

		Process Management	Project and Work Management	Service Establishment and Delivery	Support
High Maturity	ML 5	<ul style="list-style-type: none"> Organizational Performance Management 			<ul style="list-style-type: none"> Causal Analysis & Resolution
	ML 4	<ul style="list-style-type: none"> Organizational Process Performance 	<ul style="list-style-type: none"> Quantitative Work Management 		
ML 3		<ul style="list-style-type: none"> Organizational Process Focus Organizational Process Definition Organizational Training 	<ul style="list-style-type: none"> Integrated Work Management Risk Management Capacity and Availability Management Service Continuity 	<ul style="list-style-type: none"> Strategic Service Management Service System Development Service System Transition Incident Resolution and Prevention 	<ul style="list-style-type: none"> Decision Analysis & Resolution
ML 2			<ul style="list-style-type: none"> Work Planning Work Monitoring & Control Requirements Management Supplier Agreement Management 	<ul style="list-style-type: none"> Service Delivery 	<ul style="list-style-type: none"> Configuration Management Measurement & Analysis Process & Product Quality Assurance

Institutionalisation



When ways of working are 'institutionalised'

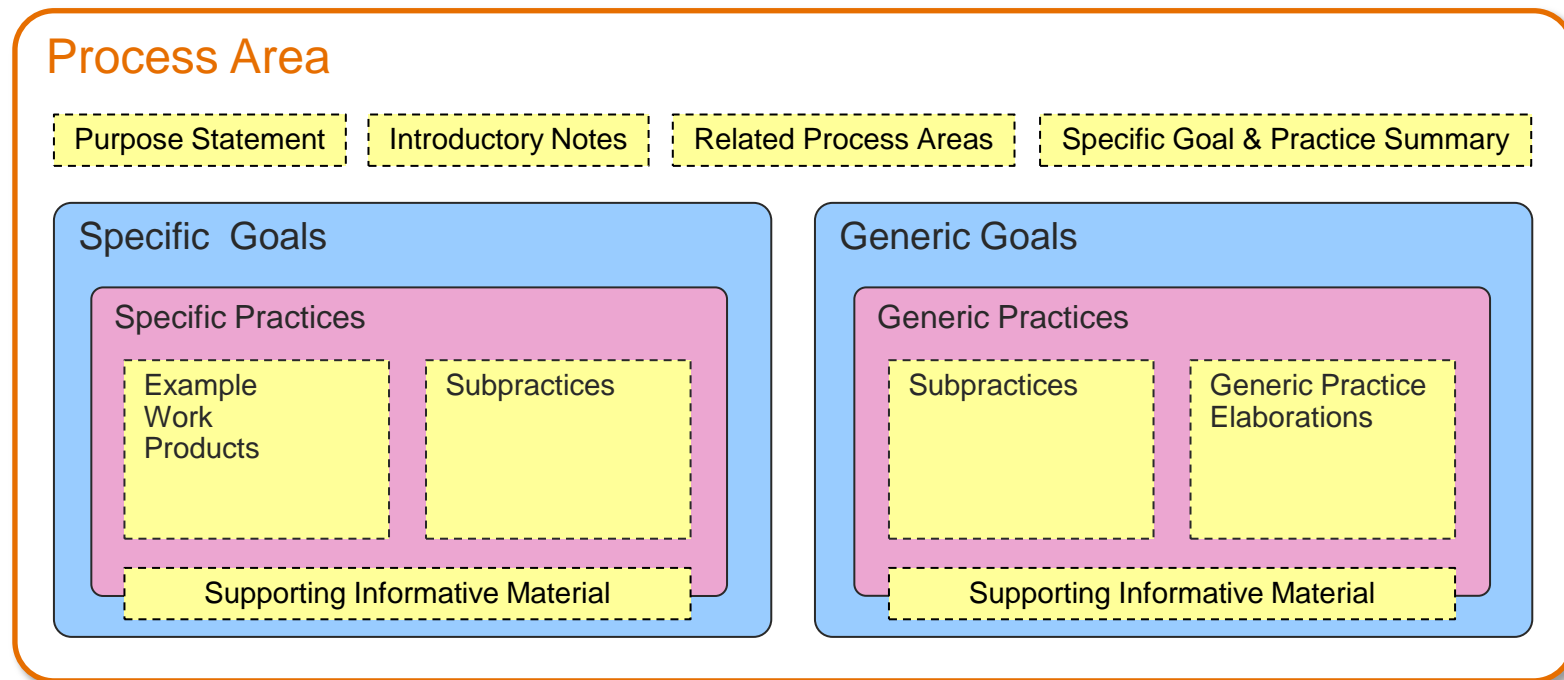
- Desirable behaviours and habits are ingrained
- We don't abandon good practices when the going gets tough
- Improvements live on after their champions have left the organisation




Selected examples of Generic Practices (that support institutionalisation)

- Setting organisational expectations for a process through **policy**
- Providing **adequate resources** to perform a process
- Ensuring people have the **skills and expertise** needed to successfully execute a process

A vision for what it's like to work in the organisation

Process Area Components

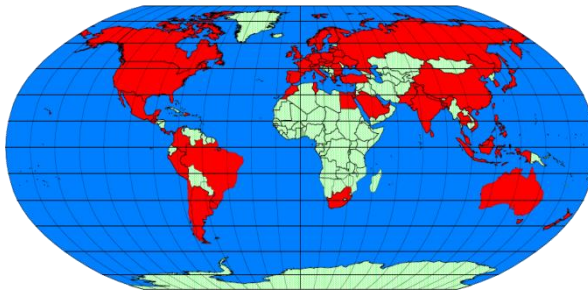


-  Goals - Characteristics that must be present
-  Practices - Activities important in achieving Goals (implemented explicitly, or equivalent)
-  Informative - Aid understanding of Goals and Practices

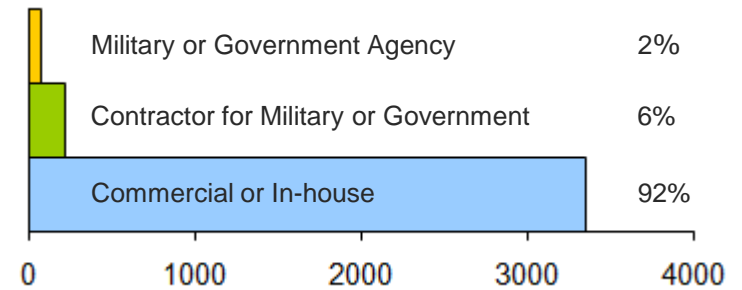
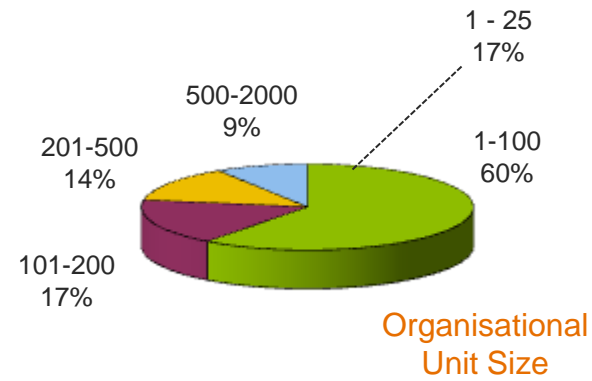
CMMI Adoption

6,126 Class 'A'
Appraisals reported

- 34,291 projects
- 4,909 organisations
(75% non-US)



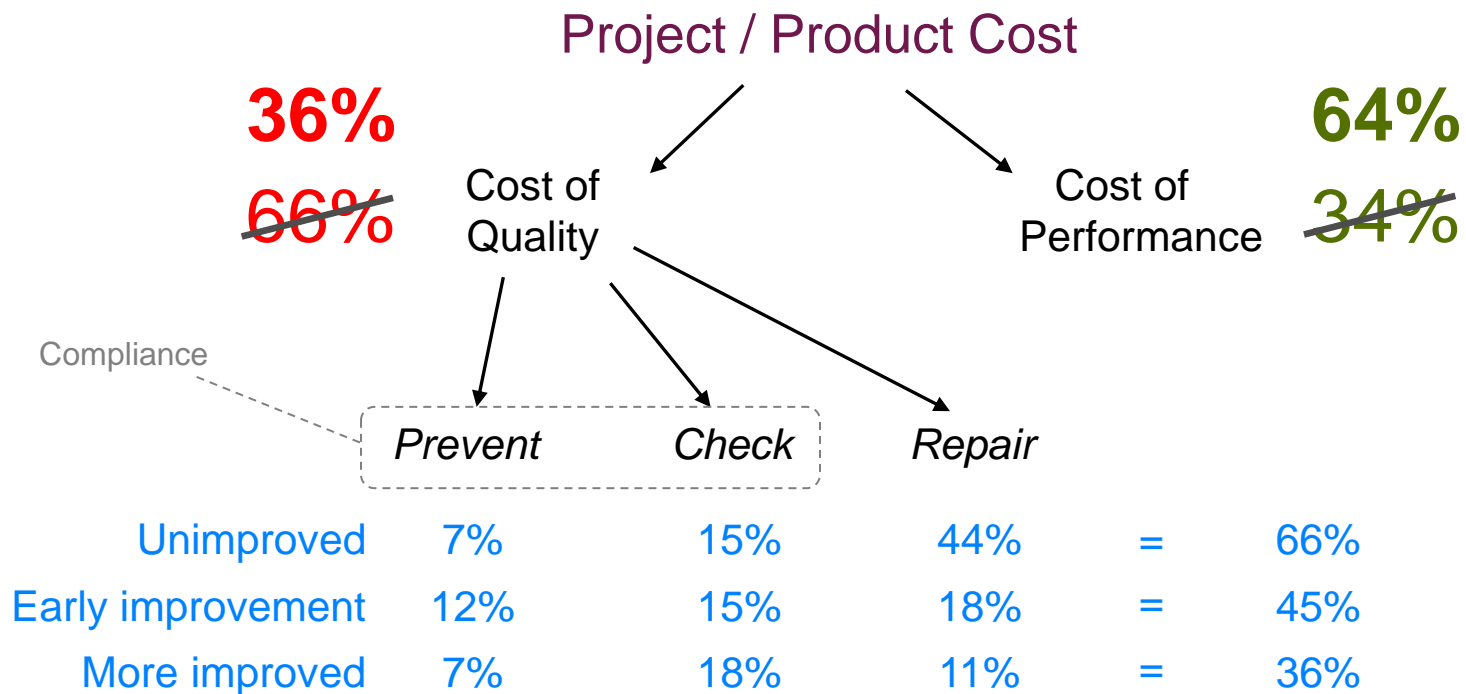
71 Reporting Countries



Categories of Organisations (non-US)

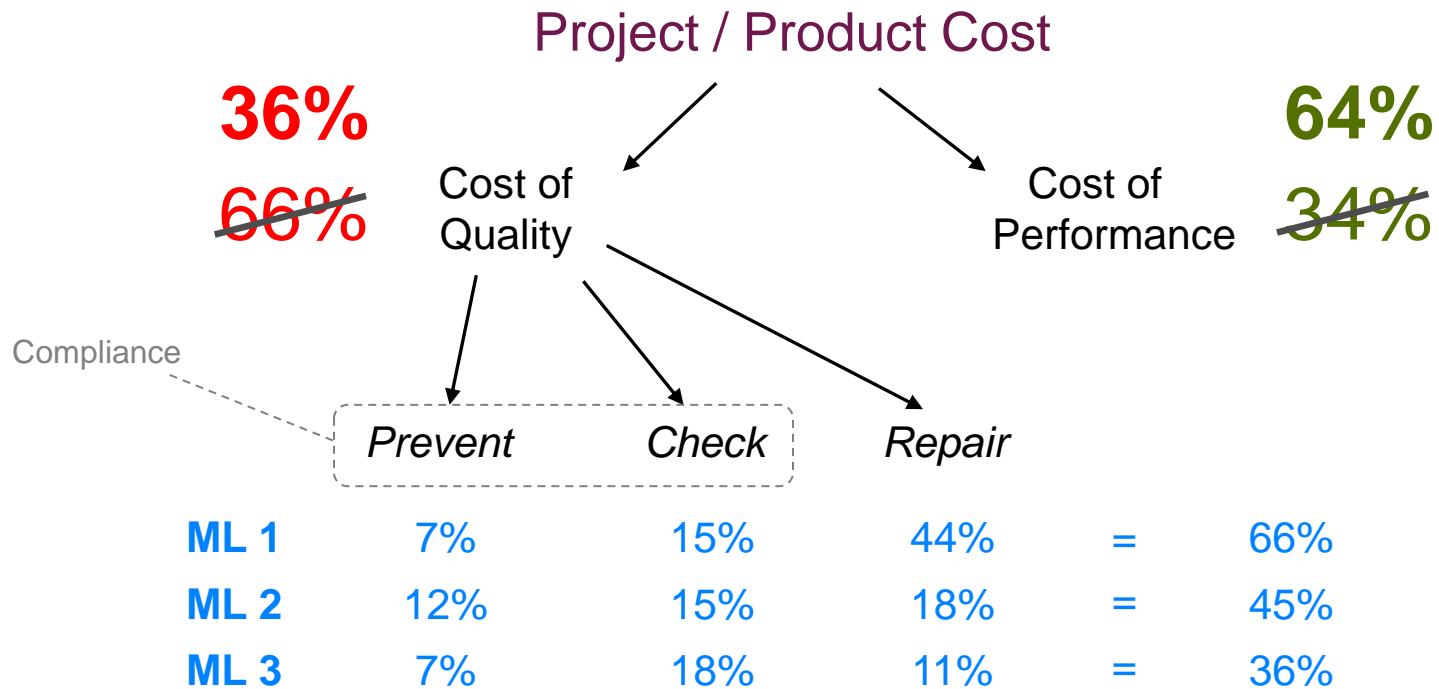
Sources: SEI Process Maturity Profile Sep 2010 (from data Apr 2002 to Jul 2010)

The Cost of Quality



Based on Quantifying the Benefit of Software Process Improvement, Raytheon

Benefits₁



Based on Quantifying the Benefit of Software Process Improvement, Raytheon

Benefits₂

Benefit	ML 1	ML 2	ML 3	ML 4	ML 5
Rework	40%	20%	10%	6%	3%
Estimating Accuracy	+30% to >100%	±10% to ± 20%	±5%	±3%	±1%
Delivered Defects	d	d÷2	d÷4	d÷10	d÷100
Pre-test Defect Detection	≤30%	60%	80%	90%+	99%
Productivity	p	1.5p	2p	3-4p	>4p
Component Reuse	negligible	negligible	occasional	≥30%	≥50%

Source: Borland Software Corporation

Summary

- Productivity, quality and process
- History and context for CMMI
- CMMI architecture and content overview
- Benefits



Next Steps

“Insanity: doing the same thing over and over again and expecting different results.”

Albert Einstein



Questions?

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