Formalizing Agility, Part 2

How an Agile Organization Embraced the CMMI

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Context and Background

… in which we briefly discuss DTE Energy and our IT organization, agile heritage, and continuous improvement focus.

DTE Energy

Organization context for this experience report

DTE Energy	Information Technology Services

- A leading energy provider
  - $7 billion US in revenues
  - $21 billion US in assets
  - 2.1 million electric customers
  - 1.2 million natural gas customers
- Diverse regulated and non-regulated portfolio
  - DTE Biomass Energy
  - DTE Coal Services
  - DTE Energy Trading
  - … and more
- 11,000 Enterprise employees

- "Full-Service" internal IT shop
  - Information Office
  - Solution Engineering
  - Technology Operations
  - IT Governance
- Strong focus on process
  - Business-driven adversity to risk
  - Continuous process improvement
  - Experience with CMM, ITIL
- 860 IT resources
  - 660 employees, 200 contractors
  - ~40% deliver, support software

Agile Solution Delivery

Process context for this experience report

- Embraced what would later be called "agile methods"
  - Started in June 1998 with enterprise-wide utility deregulation
  - Significant "nexus point" of change across the business and IT
  - Support from senior leadership was critical to our success
- Extended our "house blend" of adaptive, agile methods
  - Applied agile techniques on small and large projects
  - Based on simple, generative rules that enable complex behavior
  - Customized "just enough" process for our business and IT culture

By the mid-2001, our track record of delivering working software and enabling business success was well-established.

Continuous Improvement Focus

Enabling sustainable process growth and learning

- We sought to mature and institutionalize our process
  - One team focused on injecting CMM-based formality and rigor
  - Another team focused on scribing an agile "hitchhiker's guide"
  - Both teams had similar intentions: common, repeatable process

- We needed a Software Engineering Process Group (SEPG)
  - Formed a group of in-house process owners and practitioners
  - Facilitated weekly meetings to address strengths and weaknesses
  - Focused on developing and maturing a meaningful, usable process

Our challenge was to balance agility and rigor in a process to be used throughout a large corporate IT organization.

A Clear and Elevating Goal

Enabling operational excellence across our IT group

- Our IT Strategic Plan includes this strategic action plan:

  Achieve CMMI Maturity Level III Assessed Capability

  - Improve the maturity of our software delivery capability by means of the Capability Maturity Model Integration (CMMI) model.
  - By achieving and sustaining an industry-recognized degree of organizational maturity, we expect to be demonstratively better equipped to satisfy the software engineering needs of our business partners.

Three Big Questions

We benefited from clear and precise answers

- *Why* are we doing this?
  - Plaque build-up … or our journey toward operational excellence?
  - We viewed the CMMI as a valuable "means to an end"
- *Who* is doing this to us?
  - A squad of consultants … or our own software practitioners?
  - We recognized that effective, enduring change comes from within
- *How* are we going to do this?
  - A different approach … or our proven agile methods?
  - We used our process to deliver and support our process

The Journey toward Formalizing Agility

… in which we discuss the time-boxed program, the roles involved, and highlight the four releases from 2005 through 2006.

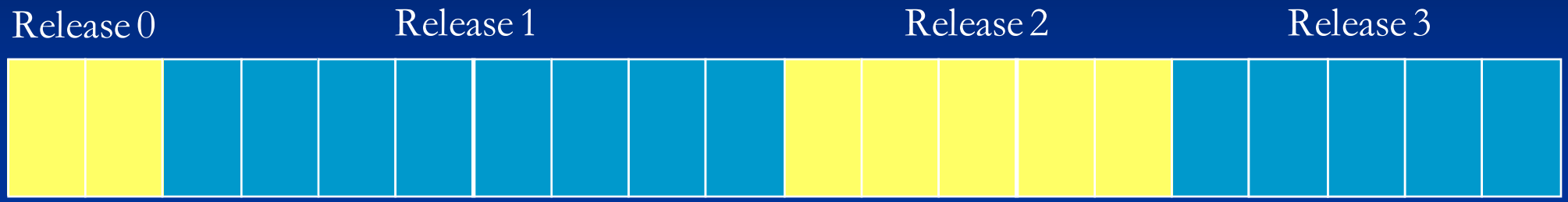
Program Philosophy

Our approach to delivering a process product

- Embraced many "traditional" agile best-practices
  - Metaphor … uplifted the team with a shared vision and perspective
  - Simple design … leveraged our agile current-state as common foundation
  - Planning game … maintained high-level focus with sufficient precision
  - Small releases … enabled a time-boxed cadence for delivery and feedback
  - Sustainable pace … balanced our commitments with other responsibilities
  - Coding standard … ensured common notation and terminology
  - Customer tests … confirmed that our deliverables met our needs
- Tailored other "traditional" agile best-practices a bit…
  - Collaborative "process-ing" … encouraged pairing on higher-risk items
  - Part-time resources … improved our ability to apply on-the-job
  - Distributed resources … embedded change agents within projects

Program Timeline

Incremental delivery and iterative maturity



- Four time-boxed releases
  - R0 … Two iterations *(Jun – Jul 2005)*
  - R1 … Seven iterations + Warranty Period *(Jul – Dec 2005)*
  - R2 … Four iterations + Warranty Period *(Jan – Apr 2006)*
  - R3 … Four iterations + Warranty Period *(Apr – Jul 2006)*

Our plan was to deploy a tested "code base" of process assets with expanded coverage and greater maturity each release.

Release 0

Highlights from our program initiation (Jun – Jul 2005)

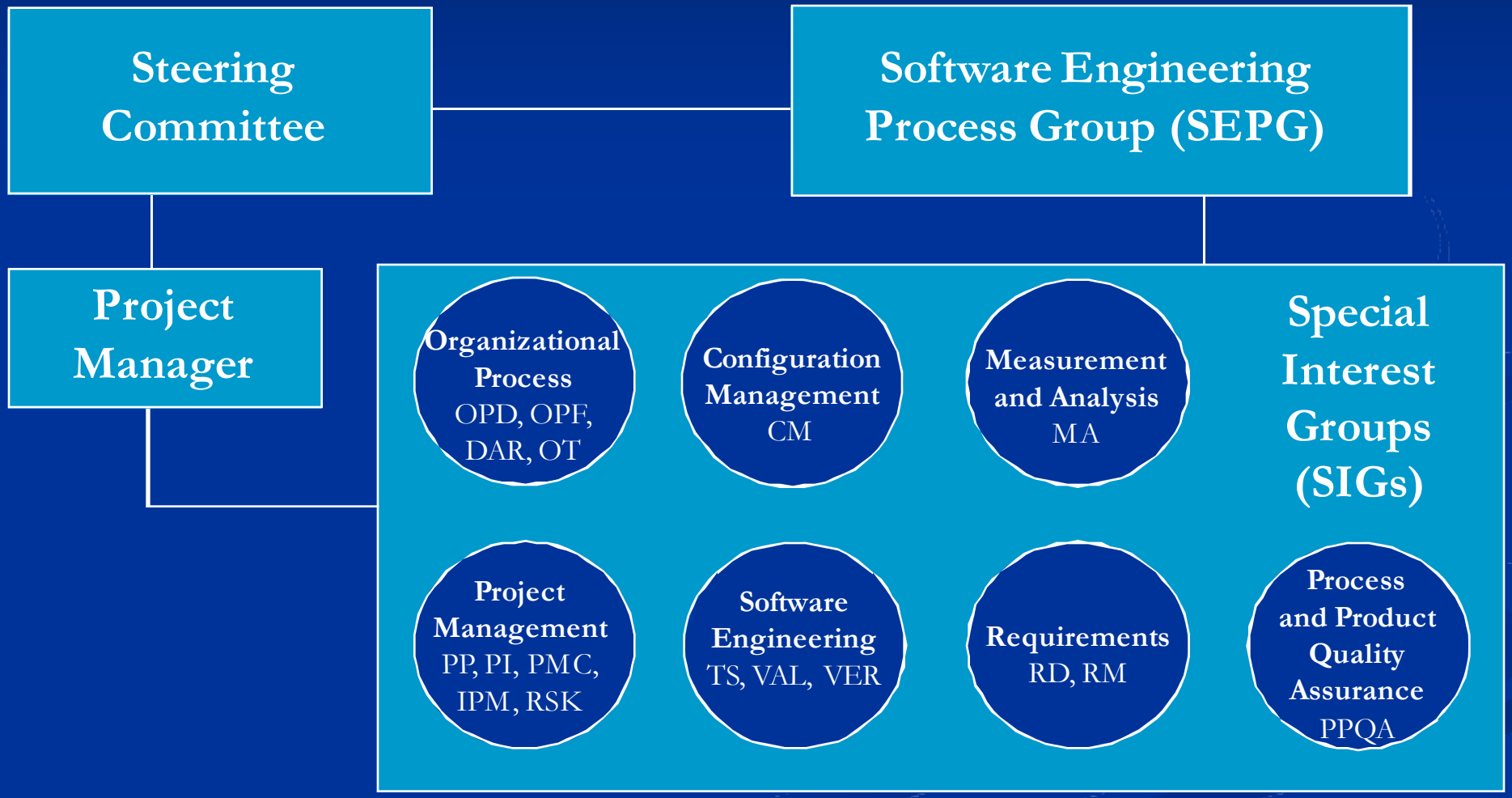
- In Release 0 (two iterations; four weeks) we…
  - Confirmed our intent and rationale for proceeding
  - Addressed the "buy vs. build" decision
  - Chartered the governance groups and process teams
  - Retained a "tour guide" to coach and mentor us
  - Clarified high-level requirements (the CMMI framework)
  - Selected a test process (the SCAMPI method)
  - Articulated requirements and features for Release 1

… positioned ourselves for enduring program success.

In Release 0 we delivered the capability to produce a process product.

Governance Structure

Ensuring consistent process improvement



Release 1

Highlights from our initial deployment (Jul – Dec 2005)

- In Release 1 (seven iterations; twenty weeks) we…
  - Formed the Special Interest Group (SIG) process teams
  - Educated ourselves on the CMMI process framework
  - Monitored progress and results across the different SIGs
  - Recognized a dependency problem and realigned the schedule
  - Documented our agile process in CMMI-friendly terms
  - Piloted the process on real-world software projects
  - Tested our performance with a SCAMPI Class B internal appraisal

… delivered a defined agile process in sufficient rigor.

In Release 1 we validated and delivered a complete process framework.

Validation and Integration Workshop

A significant two-day event in mid-Release 1

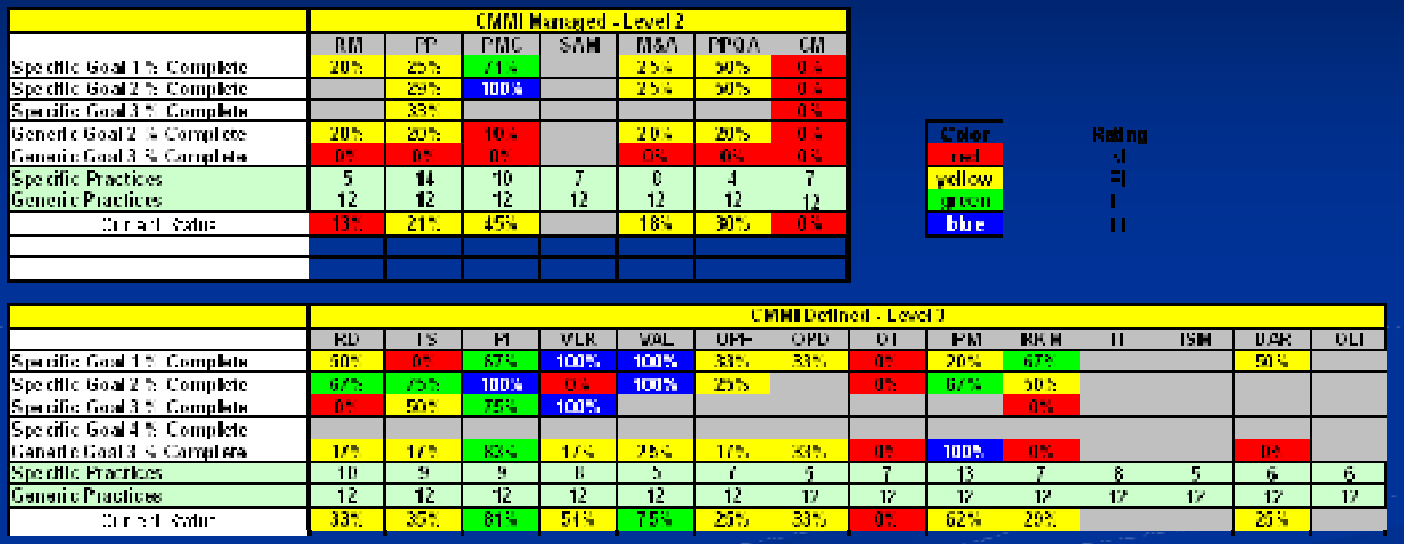
- We sought to validate that our SDP is the "Right Thing"
  - Review, discuss, and integrate Process Area models
  - Clarify the big picture, and uncover/confirm dependencies
  - Propose and agree to our communication and training plans

The 80% Solution

Release 1 focused on a "soup to nuts" framework

- June 2005

  State of our process assets from a CMMI perspective



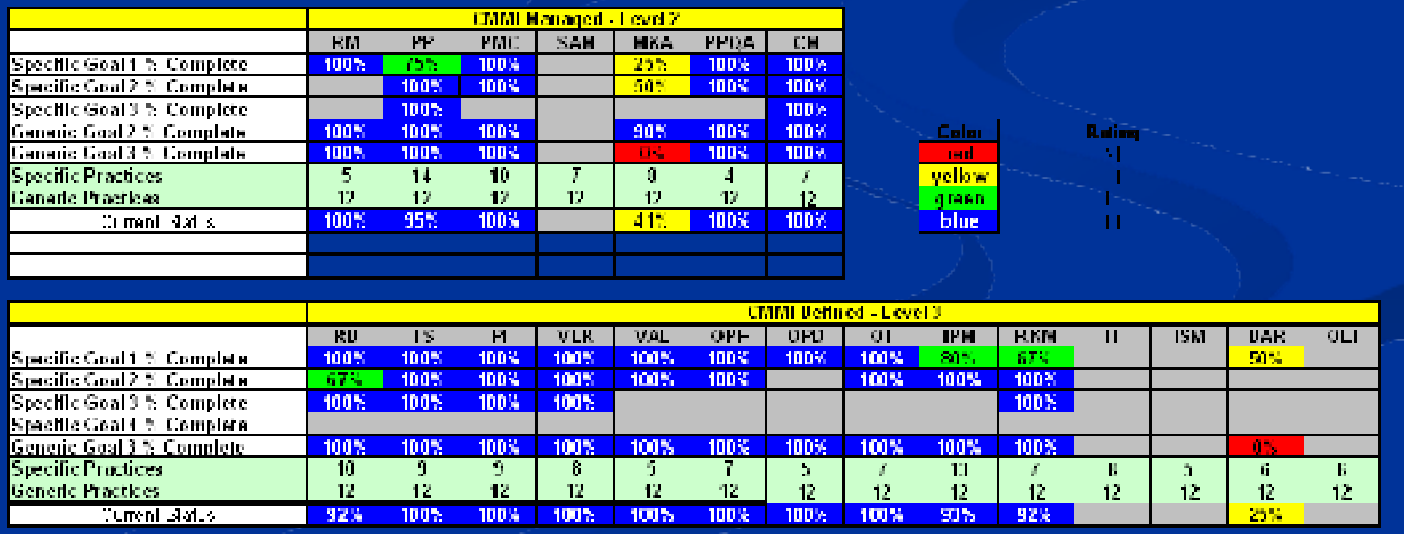
	CMMI Managed - Level 2						
	RM	PP	PMC	SAM	M&A	PPQA	CM
Specific Goal 1 % Complete	20%	25%	71%		25%	50%	0%
Specific Goal 2 % Complete		25%	100%		25%	50%	0%
Specific Goal 3 % Complete		33%					0%
Generic Goal 2 % Complete	20%	20%	100%		20%	25%	0%
Generic Goal 3 % Complete	0%	0%	0%		0%	0%	0%
Specific Practices	5	14	10	7	8	4	7
Generic Practices	12	12	12	12	12	12	12
Current Status	13%	21%	45%		16%	30%	0%

Color	Rating
red	0
yellow	1
green	2
blue	11

	CMMI Defined - Level 3													
	RD	TS	PI	VER	VAL	OPF	OPD	OT	IPM	RSKM	IT	ISM	DAR	OEI
Specific Goal 1 % Complete	50%	0%	67%	100%	100%	33%	33%	0%	20%	67%			50%	
Specific Goal 2 % Complete	67%	25%	100%	0%	100%	25%		0%	67%	50%				
Specific Goal 3 % Complete	0%	50%	75%	100%						0%				
Specific Goal 4 % Complete														
Generic Goal 3 % Complete	100%	100%	83%	100%	25%	100%	33%	0%	100%	0%			0%	
Specific Practices	10	9	9	8	5	7	5	7	13	7	8	5	6	6
Generic Practices	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Current Status	33%	35%	81%	54%	75%	25%	33%	0%	62%	29%			25%	

- December 2005

  State of our process assets from a CMMI perspective



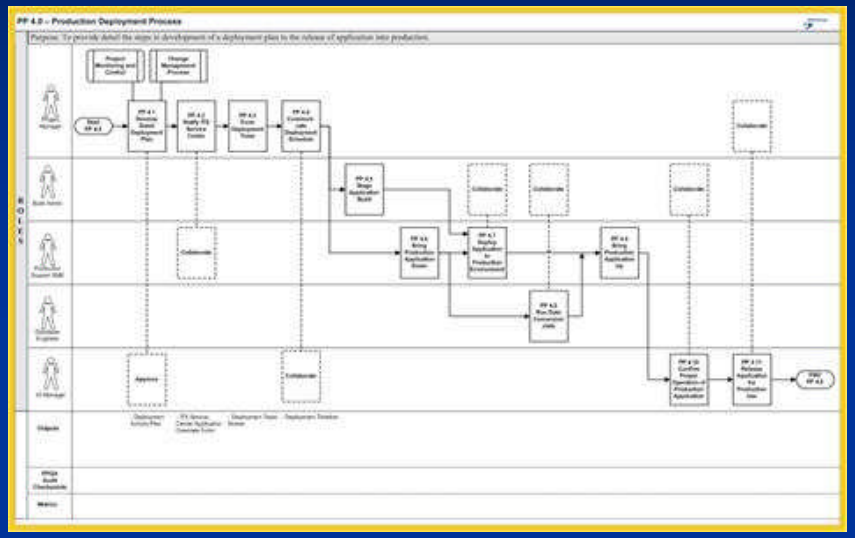
	CMMI Managed - Level 2						
	RM	PP	PMC	SAM	M&A	PPQA	CM
Specific Goal 1 % Complete	100%	75%	100%		25%	100%	100%
Specific Goal 2 % Complete		100%	100%		50%	100%	100%
Specific Goal 3 % Complete		100%					100%
Generic Goal 2 % Complete	100%	100%	100%		50%	100%	100%
Generic Goal 3 % Complete	100%	100%	100%		0%	100%	100%
Specific Practices	5	14	10	7	8	4	7
Generic Practices	12	12	12	12	12	12	12
Current Status	100%	95%	100%		41%	100%	100%

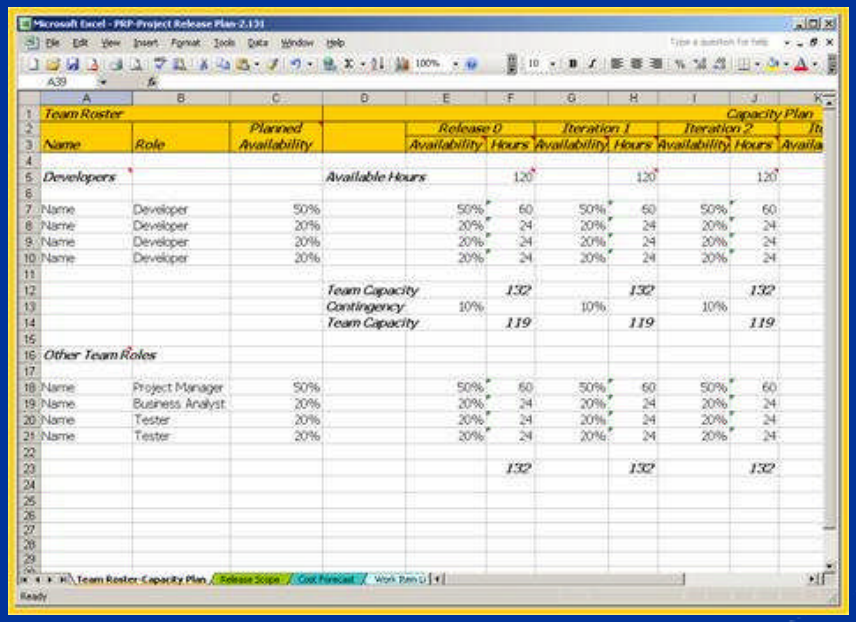
Color	Rating
red	0
yellow	1
green	2
blue	11

	CMMI Defined - Level 3													
	RD	TS	PI	VER	VAL	OPF	OPD	OT	IPM	RSKM	IT	ISM	DAR	OEI
Specific Goal 1 % Complete	100%	100%	100%	100%	100%	100%	100%	100%	80%	67%			50%	
Specific Goal 2 % Complete	67%	100%	100%	100%	100%	100%		100%	100%	100%				
Specific Goal 3 % Complete	100%	100%	100%	100%						100%				
Specific Goal 4 % Complete														
Generic Goal 3 % Complete	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%			0%	
Specific Practices	10	9	9	8	5	7	5	7	13	7	8	5	6	6
Generic Practices	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Current Status	92%	100%	100%	100%	100%	100%	100%	100%	93%	92%			25%	

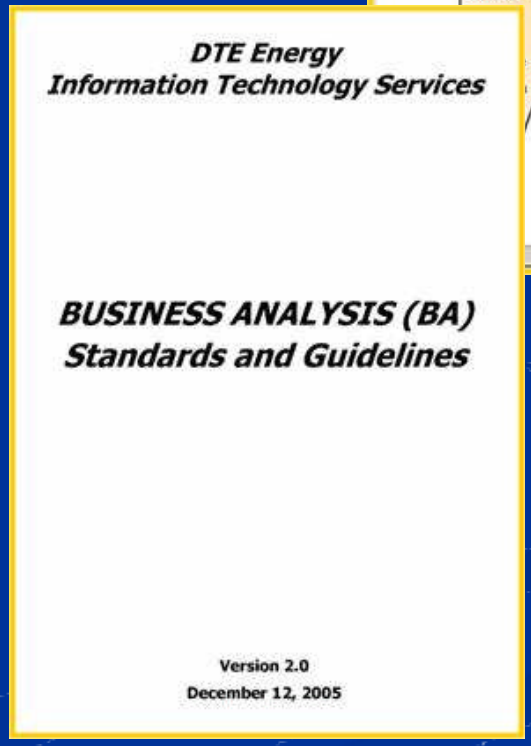
Work Product Examples

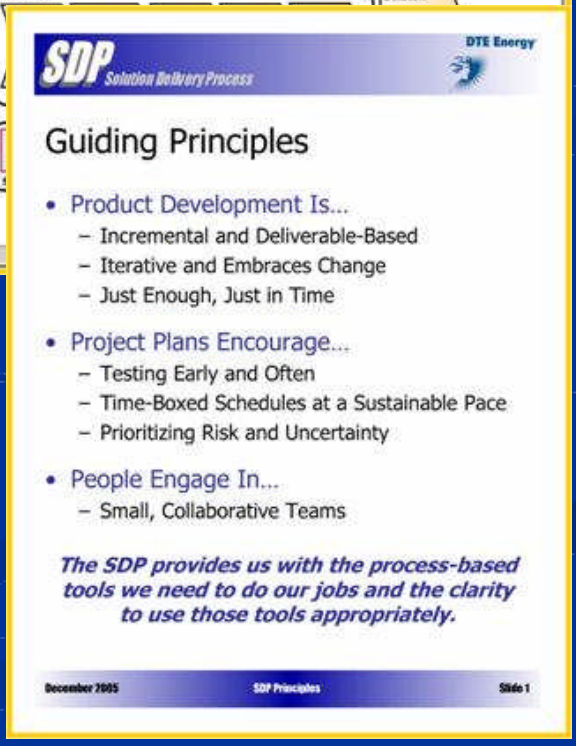
A selection of process work products





Team Roster				Release 0		Iteration 1		Iteration 2		Capacity Plan
Name	Role	Planned Availability		Availability	Hours	Availability	Hours	Availability	Hours	Availa
Developers			Available Hours		120		120		120	
Name	Developer	50%		50%	60	50%	60	50%	60	
Name	Developer	20%		20%	24	20%	24	20%	24	
Name	Developer	20%		20%	24	20%	24	20%	24	
Name	Developer	20%		20%	24	20%	24	20%	24	
			Team Capacity		132		132		132	
			Contingency	10%		10%		10%		
			Team Capacity		119		119		119	
Other Team Roles										
Name	Project Manager	50%		50%	60	50%	60	50%	60	
Name	Business Analyst	20%		20%	24	20%	24	20%	24	
Name	Tester	20%		20%	24	20%	24	20%	24	
Name	Tester	20%		20%	24	20%	24	20%	24	
					132		132		132	





Release 2

Highlights from our second release (Jan – Apr 2006)

- In Release 2 (four iterations; fourteen weeks) we…
  - Reaffirmed the Special Interest Group (SIG) process teams
  - Trained our assessment team on the formal SCAMPI process
  - Recognized a critical-path problem and changed our Org Unit
  - Expanded our scope to include non-agile project types
  - Refined our suite of SDP work products to improve clarity
  - Piloted the process improvements on real-world software projects
  - Tested our performance with a SCAMPI Class B internal appraisal

… incrementally and iteratively improved our process.

In Release 2 we expanded and refined our suite of process assets.

Responding to Change

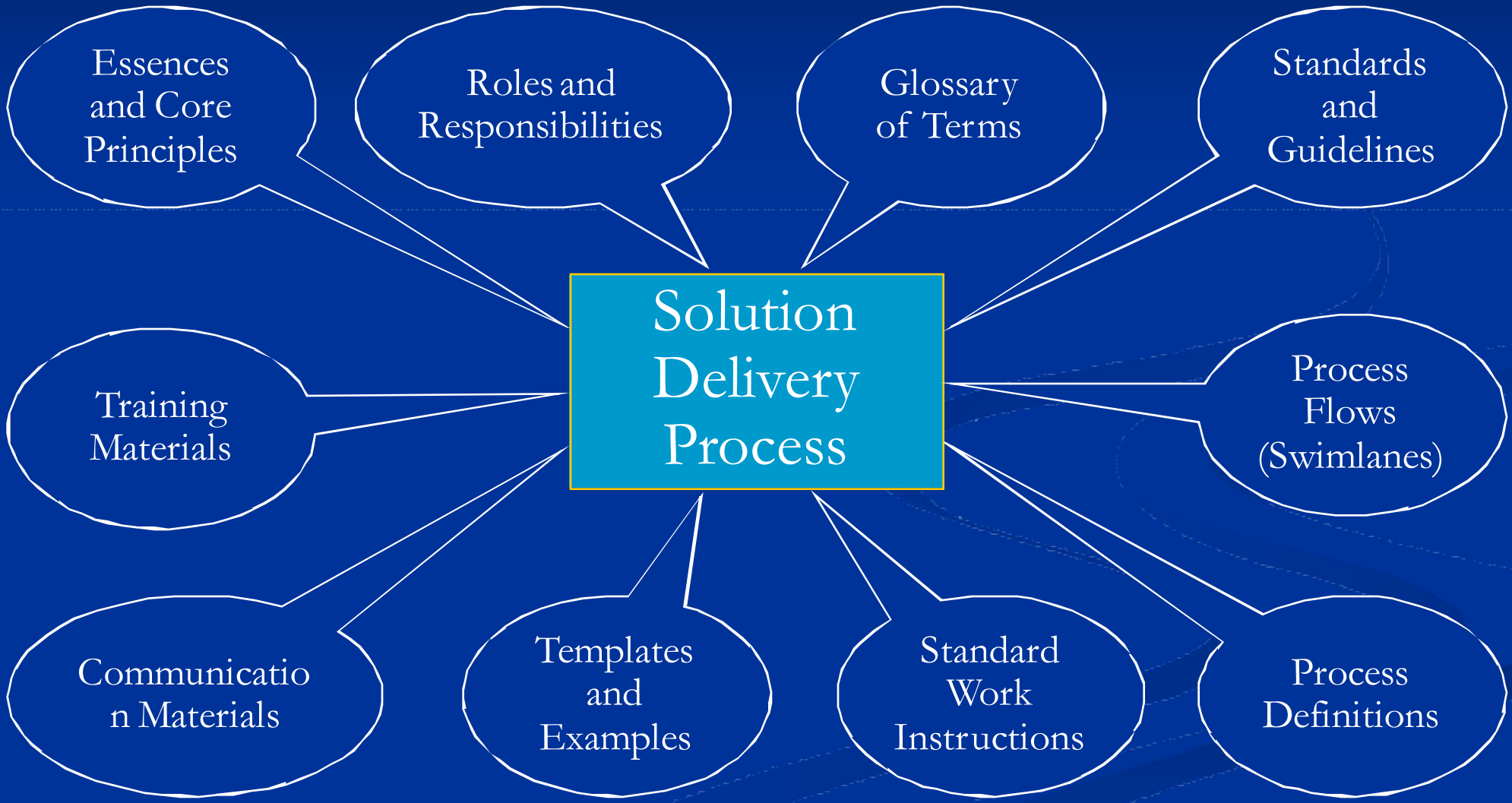
Reacting to the business realities around us

- As we completed Release 1…
  - We expected to continue with our same "Organizational Unit"
  - Java-based projects using our Traditional Agile methodology
  - Relatively small, co-located teams with internal resources
- As we began Release 2…
  - Many approved business projects were delayed or put on hold
  - We adapted and expanded our "Organizational Unit"
  - This led to revisiting the variety of SMEs on our process teams

We recognized and embraced the opportunity to change, and modified our release plans and team rosters to move forward.

SDP Components

The suite of Solution Delivery Process assets



Release 3

Highlights from our third release (Apr – Jul 2006)

- We listened and learned…
  - Incorporated feedback from our user community (project teams)
  - Launched our role-based "SDP Builder" training initiative
- We improved and refined…
  - Matured our process assets and corrected prioritized defects
  - Reduced the quantity of work products and templates
- We tested and tested…
  - Leveraged our internal assessment team and SCAMPI Lead Appraiser
  - Performed CMMI Level II and III SCAMPI Class A Appraisals

On Friday, July 14, 2006, the DTE Energy ITS Organization… achieved CMMI Maturity Level II and III with full fidelity!

The SCAMPI Appraisal Experience

Insights into our Class A Appraisals

- The "test team" performed static and dynamic tests

Interviews Held	10
Projects Reviewed	6
Process Areas Appraised	17 (96)
Specific Goals Appraised	25 (150)

Generic Practices Appraised	12 (828)
Specific Practices Appraised	83 (498)
Data Points and Evidence	3,948
Assessment Team Size	8

Reflections and Projections

… in which we briefly debrief on the journey thus far and highlight the road ahead.

Looking Back

Reflecting on what we experienced and learned

- Agile methods were well-suited for non-software projects
  - We recognized the value of generative, principle-based rules
  - A key factor was to be clear on what and how much to tailor
- The CMMI offered us a holistic reference model
  - We leveraged it as a framework rather than a cookbook
  - A key factor was to view it as an enabler that provided guidance
- Senior leadership enabled and ensured our success
  - We needed – and received – commitment and resources
  - A key factor was to "keep it real" with timely feedback and value

Going Forward

Projecting our journey and the road ahead

- Continue to use and improve our processes
  - Well-positioned for sustainable maturity and growth
  - We intend to proceed with our agile, release-based approach
- Continue to leverage industry reference models
  - Demonstrated ability to internalize best-practices as needed
  - We intend to consider additional models (CMMI ML4, ISO, etc.)
- Continue to learn and share with software practitioners
  - Benefited greatly from exchanging information with others
  - We intend to remain engaged with the industry at large

Key Points

Considerations as you embark on process improvement

- Know *why* you are doing this
  - Plaque build-up … or your journey toward process improvement?
  - Leverage models such as CMMI as valuable "means to an end"
- Know *who* is doing this
  - A squad of consultants … or your own software practitioners?
  - Recognize that effective, enduring change comes from within
- Know *how* you are doing this
  - A different approach … or well-established agile methods?
  - Use an agile process to deliver and support your process

Thank You!

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