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Software Industry Excellence Center

DEL TECNOLÓGICO DE MONTERREY

AIM Case Study



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TSP Symposium



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Agenda

- AIM Pilot project.
- Company background.
- Project context.
- Initial CMMI Gap analysis.
- Managing the EPG.
- Project Status.
- Implementation strategy.
- HLD document.
- Lessons learned.

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- Accelerated Improvement Method.
- Formalization of methods used by SEI customers to combine the best of two great technologies

- PSP/TSP



- CMMI.



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- Main idea
 - to decrease the time to reach CMMI ML3 by obtaining the synergy of combining both methodologies
 - Use of TSPm as a foundation
- Self directed teams.
- Personal Quality.
- Commitments from engineers.
- Short testing cycles.
- High performance.
- Organizational process assets.
- Organizational process improvement.

AIM Pilot



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- Scope
 - Achieve CMMI ML3 using TSP as a foundation.
- Uses “TSP 2009.09” release.
- Uses the unreleased “TSPm 2008.09”
- Actors:
 - SILAC, Mexican Software Company.
 - Software Industry Excellence Center (SIE Center) of Tecnológico de Monterrey (Tec).
 - Software Engineering Institute (SEI).



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SILAC PSP/TSP Background

- Received first PSP training in 2006.
- TSP Coach Training in 2007.
- One Certified Coach and one PSP instructor
- 50% of trained PSP developers.
- 10 full time engineers.
- Web Applications for administrative domain projects.
 - (6...12) months; (4...7) engineers; 10,000 LOC.



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Project Context – 1

- Assumptions:
 - SILAC Engineers and EPG members fully understood PSP/TSP elements and SILAC process.
 - TSP was fully deployed.
- Strategy:
 - Build a plan based on SEI TSP to CMMI mapping [McHale 2005].
- Process asset library:
 - No Organizational Set of Standard Processes.



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Project Context – 2

- TSPm:
 - Process Group managed as TSP project.
 - New Roles definition for process group.
 - More responsibilities (process and quality manager)
 - Process elements for:
 - OPF, OPD, OT, IPM, RSKM, PPQA, CM.



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Project Context – 3

- Consultants:
 - Internal coach with **no** CMMI background.
 - First external coach with **no** CMMI implementation.
 - CMMI assessor with **no** TSP coach background.

Project Context – 3

- EPG Launch in November 2009.
- CMMI gap analysis.
- Software development team Relaunch.
- EPG Relaunch.
- Checkpoint for EPG.





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Project Strategy

- Cycle one
 - Become familiar with TSPm.
 - CMMI training;
- CMMI Consultant
 - Gap analysis

CMMI Gap Analysis – 1

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Process Areas Characterization					
Process Area	SG1	SG2	SG3	GG2	GG3
Requirements Management					
Project Planning		✓	✓		
Project Monitoring and Controlling	✓				
Measurment and Analysis		✓			
Configuration Management	✓				
Process and Product Quality Assurance					
Supplier Agreement Management	NA	NA	NA	NA	NA
Requirements Development	✓				
Technical Solution		✓			
Product Integration		✓			
Verification		✓			
Validation					
Organizational Process Focus		✓			
Organizational Process Definition					
Organizational Training					
Integrated Project Management		✓			
Risk Management					
Decision Analysis and Resolution					



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CMMI Gap Analysis – 2

- TSP partially deployed
 - Engineers new to the organization with no PSP training.
 - Alternative processes not documented.
 - Missing TSP artifacts.

Managing the EPG

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- EPG handles the software process improvement.
- EPG is managed as a TSPm team
 - New: Training Manager; Coaching Manager;
 - Extended: Support Manager; Quality Manager.
- Establish and maintain the OSSP:
 - Process Asset and Data Repository Manager.





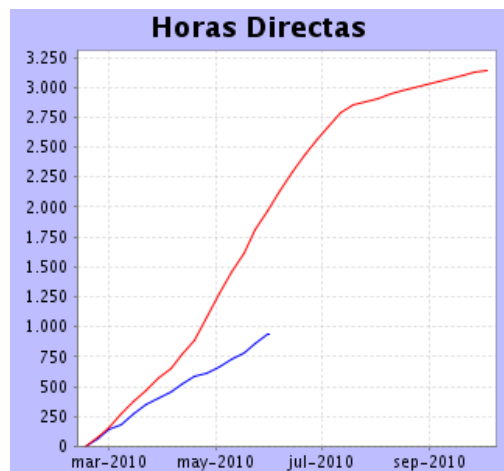
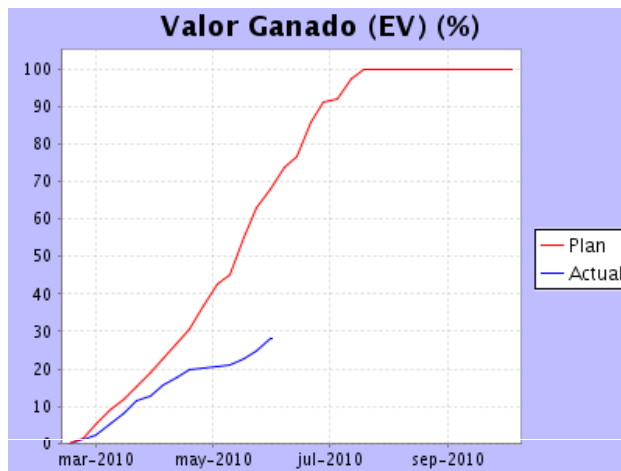
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Managing the EPG

- Cycle two
 - New team lead.
 - Technical members left the company.
 - Relaunch.
 - Lack of experience in SILAC processes.
 - No PSP training.
 - Poor tool support.
 - Misunderstanding of role responsibilities.
 - Poor post launch coaching.

Project Status: Cycle 2

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- Monitoring problems in cycle one and two could have been mitigated with proper staffing, training, and coaching.
- EPG members with no process improvement experience.
- Project Relaunch in April 2010.



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Project Status: Cycle 2

- EPG Checkpoint findings:
 - PG members with no software experience.
 - English Language Barriers.
 - Lack of documented guidelines.
 - PG members and Engineers did not fully understand TSP.
 - Not enough post-launch coaching.
 - Not enough management involvement.
 - Not enough SEI guidelines and monitoring.



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Implementation Strategy – 1

- Guiding principle
 - Use TSPm process elements and philosophy as foundation.
- Cycle 1
 - Building infrastructure; Training; PG repository.
- Cycle 2
 - CMMI process and project management:
 - OPD, OPF, OT.
 - PP, PMC, RSKM, IPM, REQM.
 - CMMI support:
 - PPQA, CM.



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Implementation Strategy – 2

- Cycle 3
 - Engineering and others:
 - RD, TS, PI, VER, VAL, DAR, MA.
 - SCAMPI B.
- Cycle 4
 - Refining processes.
 - SCAMPI A.



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HLD Document – 1

- Purpose: document the design and the design rational.
- A HLD document per CMMI process area
 - Documentation of requirements.
 - Associated TSP Process Elements (PE).
 - Relationship between PE and CMMI practices.
 - Relationship among TSP process elements.



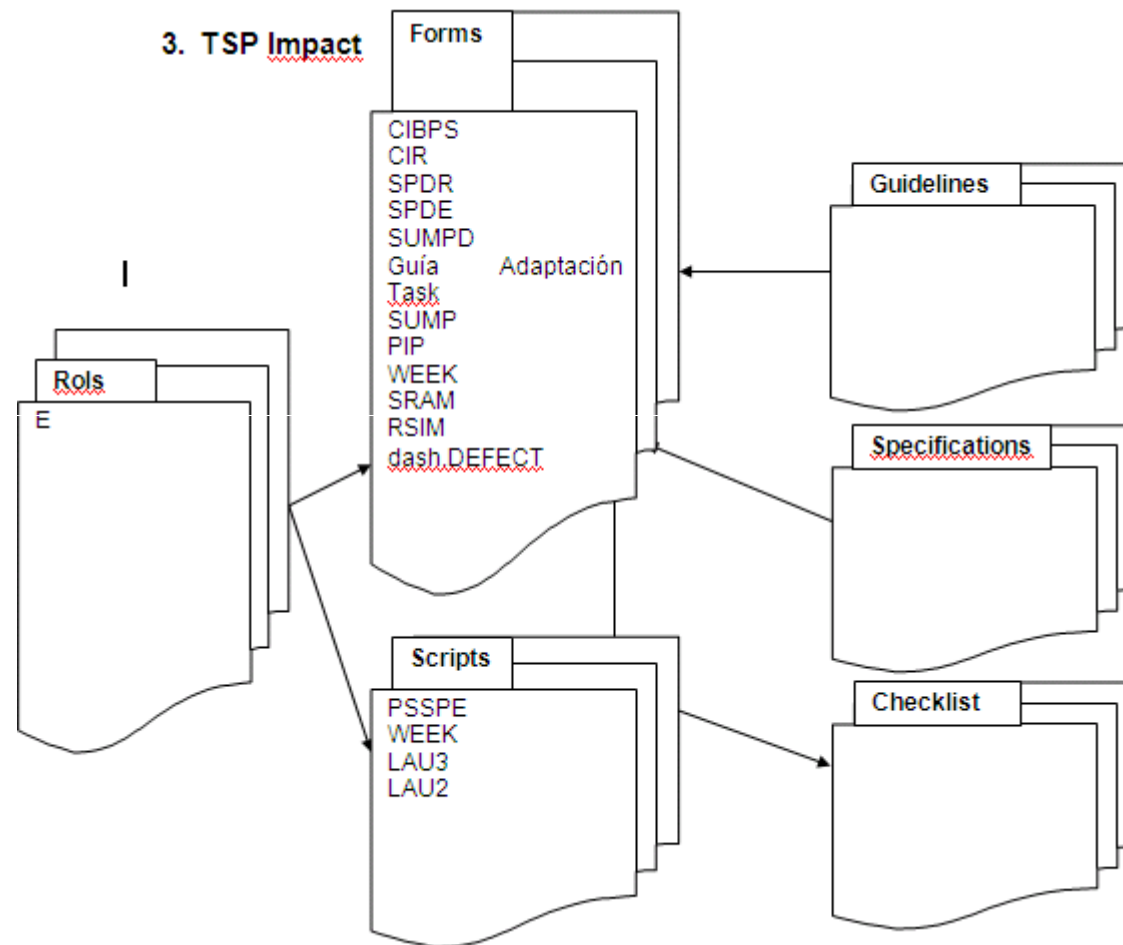
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HLD Document – 2

- Sections:
 - Requirements: CMMI and company needs.
 - TSP life cycle and related process elements.
 - Related TSP process elements (categories):
 - Scripts, Forms, Specifications, Guidelines, checklists.
 - Relationship between PE and CMMI practices:
 - Relationship description.
 - Change description.
 - New process element, if necessary.
 - Flow diagram for process elements.

HLD Document – 4

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PPQA

HLD Document – 5

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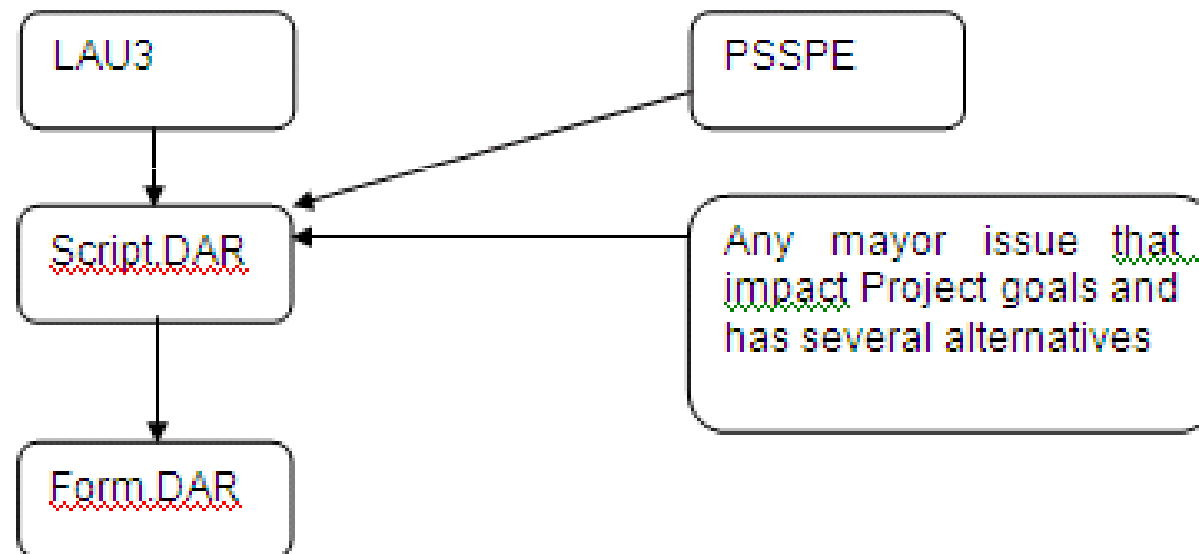
Process Element	Change Description
Form.DAR	Create templates for selecting review method Create templates for selecting architecture/complex-component
Script.DAR	<ul style="list-style-type: none"> - In GENERAL part add: When a decision would cause schedule delays over a certain percentage or specific amount of time - Flip steps 2 and 3. First criteria then look for alternatives - Add in step 2. Types of criteria to consider include: technology limitations, total ownership and lifecycle costs. - Add in step 3 (penu/imp bullet) literature search - Add in step 4: Different methods can be used to evaluate different alternatives. Similarly, different methods can be use for each of the specified criteria - Add in step 8: When alternative solutions have similar total scores, consider the impact and probability of the risk of implementing the solution. An alternative with the smallest risk may be selected instead.
Script.PSSPE	Step 3. Consider the use of DAR if selection of some processes may affect quality / cost / schedule requirements Step 4 If customer constraints require new processes consider using DAR to select new method, tools and processes (if applicable)
Script.LAU3	Add in step 9 (plan process): If customer constraints require new processes consider using DAR to select new method, tools and processes (if applicable)
Rel.	NA
Guideline.	The guideline is already considered in script.DAR
Specification.NOTEBOOK	Consider adding a note to create a folder for DAR's implemented
Checklist.	NA

DAR

HLD Document – 6

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Flow Diagram

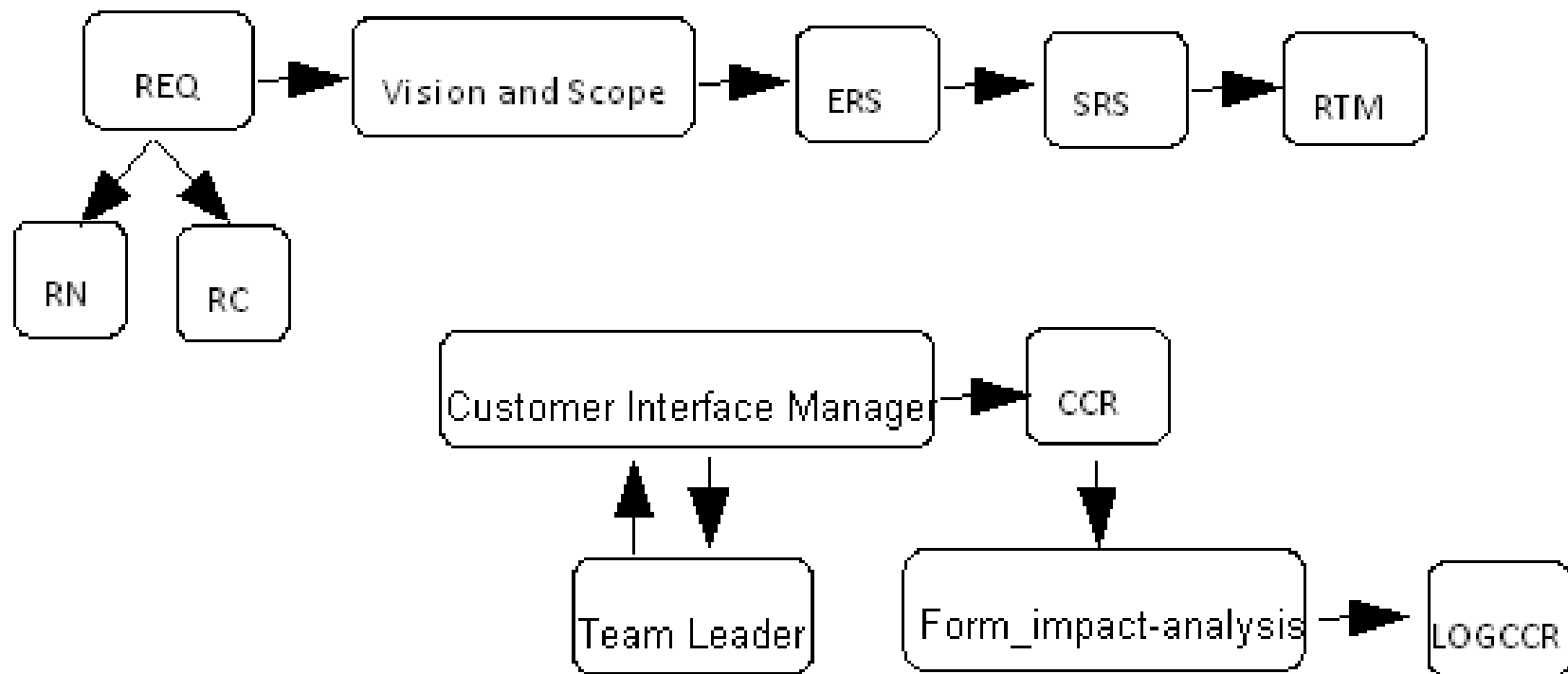


DAR

HLD Document – 7

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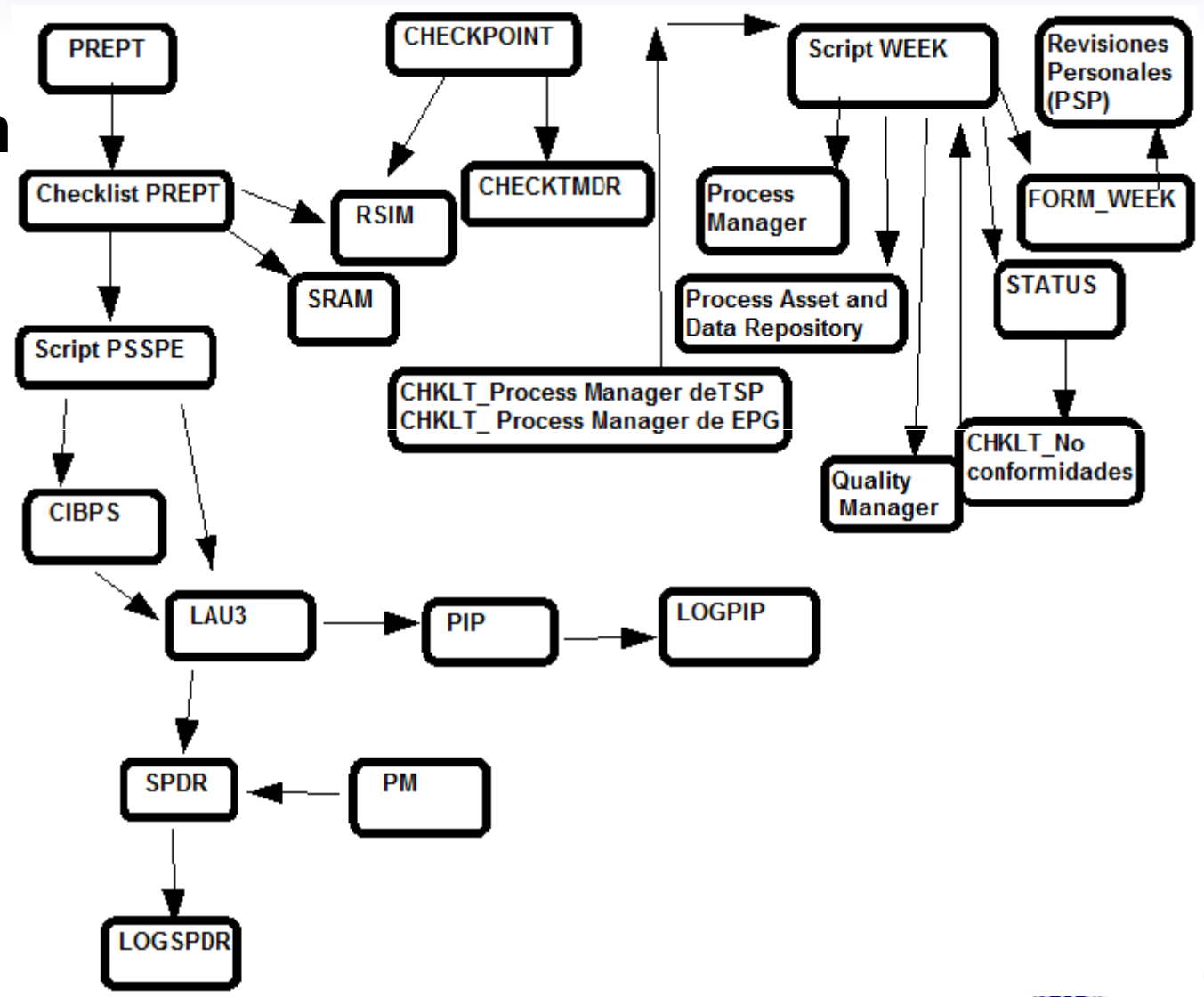
Flow Diagram



REQM

HLD Document – 8

Flow Diagram



PPQA



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HLD Document – 9

- HLD Strengths:
 - Provides different points of view.
 - Depicts relations and flows for process elements.
 - Facilitates understanding of TSP process elements.
 - Identify TSP and CMMI relationships.
 - Documents the missing elements.
 - Facilitates understanding of CMMI process area.
 - Builds a bridge between TSP coaches and CMMI consultants.



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Lessons Learned – 1

For a successful implementation of AIM consider:

- Process group membership:
 - Experience in Software Process Improvement (SPI) implementation.
 - Hands on experience in company-software-development processes.
- Process group training:
 - Hands on experience in TSP processes.
 - CMMI process model.
 - Managing SPI projects.



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Lessons Learned – 2

- EPG Coach training:
 - hands-on-experience in coaching TSP teams.
 - hands-on-experience implementing CMMI SPI projects.
 - Allowing to: Keep TSP principles; fulfill CMMI requirements; and add value with new process elements.
- Handling internal and external coaches:
 - responsibilities must be explicit and documented.
 - periodic status meetings.
 - Cross checkpoints among TSP teams



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Lessons Learned – 3

- AIM Implementation:
 - Initial TSP evaluation
 - Initial CMMI Gap Analysis (SCAMPI B)
 - Both provide the bases to estimate the effort to comply with the reference models
 - Avoid incorrect assumptions
- High Level Design (HLD) Document:
 - Identify affected and missing TSP process elements
 - Provides the means to ensure that the process group understands both CMMI process needs and TSP current processes

OPF



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Lessons Learned – 4

- Post Launch Coaching:
 - Tool support, data gathering, weekly meetings, role support, interpreting data, establishing a OSSP, managing organizational change, interpreting CMMI process areas
- SEI support for AIM:
 - Implementation guidelines .
 - SEI tracking and oversight for pilot projects.
 - TSPm for CMMI users.

Lessons Learned - 5



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- Engineers must be capable of handling technology and processes.
- Lack of technical skills cause the team to diverge from processes.
- Select a Process Support Tool that make process execution natural rather than bureaucratic.



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Lessons Learned – 6

- TSP and CMMI are complementary technologies:
 - Combining them provides an amazing synergy.
 - Combining them is not an easy task, though.
 - TSP → CMMI.
 - CMMI → TSP.
 - TSP coach and CMMI consultant may misunderstand the concepts and philosophies behind these technologies.
- Because sometimes TSP & CMMI are perceived as opponent technologies:
 - proper objective support is need it.



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Lessons Learned – 7

Personal level

- **PSP:** Personal quality
 - PSPs → Team quality
- **TSP:** Strength team ← team members synergy
- **IDEAL:** change management
- **CMMI:** organizational infrastructure
- **Best when you combine its strengths**



¿Questions?



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