Deploying TSP to a Nation: Early Results from Mexico

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Agenda

Background
Results
Lessons Learned
Conclusions
Next Steps
Agenda

**Background**
- The Problem
- The Mexican Solution
  - Goals
  - Strategy
  - Challenges
- New Approaches

Results
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The Software Project Problem

Typical software projects are not successful. In engineers’ opinions, these projects
- Were not achievable from the outset
- Had excessive management pressure
- Required unreasonable overtime
- Were technically frustrating
- Had lots of team conflict
- Operated in a chaotic environment
The Software Quality Problem

Typical software projects are not successful.

- About half of development time and expense involves defect removal.
- Each mistake typically results in one or more product defects.
- Experienced developers typically inject 100 or more defects per 1,000 lines of code (KLOC).
The Mexican Challenge

Goals

• Export $5 Billion (USD) of software production

• Achieve the average in global spending on IT

• Become the leader in providing Spanish language digital content
Challenges

Scale

• This has never been attempted at a national level.
• Will need a large number of developers and coaches.

Cost

• There is a large number of Small and Medium size Enterprises (SME).
• It takes time to train teams.

Distance

• The SEI is geographically far from the Mexican teams.
• The SEI coaches have limited Spanish language skills
New Approaches

Training

• Co-teach with Spanish language instructors
• New courses
  – PSP Fundamentals
  – PSP Advanced
New Approaches

Training
- Co-teach with Spanish language instructors
- New courses
  - PSP Fundamentals
  - PSP Advanced

Strategic Partner
- Develop Mexican training capacity
- Mexican instructors now offer
  - PSP Instructor Training
  - TSP Coach Training
New Approaches

Training
• Co-teach with Spanish language instructors
• New courses
  – PSP Fundamentals
  – PSP Advanced

Strategic Partner
• Develop Mexican training capacity
• Mexican instructors now offer
  – PSP Instructor Training
  – TSP Coach Training

Certification
• PSP Engineer
  – Mexico leads the world in certified engineers
• TSP Coach
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Background

Results

• Team Examples
• Schedule
• Cost
• Quality
• Implementation Timeline
• Perceptions

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Team Example I

Challenges and Barriers

- Team of company engineers and contractors
- Resources reassigned
- Team Lead promoted
Team Example: Effort Management

Effort (hr) Act-Plan
- Effort (hr) Act-Plan
- mean
- UCL
- LCL

Week
Team Example I

Outcome
• By end of the launch, the team was integrated.
• The team always managed to re-plan.
• This group was by far the most satisfied in the facility.
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Background

**Results**
- Team Example
- **Overall Results**
  - Schedule
  - Cost
  - Quality
  - Perceptions

Lessons Learned
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60% of the IT projects in the Standish Group Chaos report were between 50% to 200% late or cancelled.

40% of the IT projects in the Standish Group Chaos report were between on-time and 50% late.
Quality

TSP System Test Performance Comparison

- System Test % of Effort
- System Test % of Schedule
- Failure COQ

- Typical Projects
- TSP Avg.
- MX Avg.
TSP System Test Quality Comparison

- Typical Projects
- TSP Avg.
- MX Avg.

System Test Defects/KLOC

Delivered Defects/KLOC
Perceptions

What kinds of reactions to using TSP do we expect from team members?
Perceptions

Quotes from team members:

“I'd never used review and inspections before, but now I can see how useful they are. The product quality is higher.”

“I personally prefer to work in a TSP team, because I have tried many methods, philosophies and recommendations, and all of them, this framework I have personally validate that it really works, and that gives excellent results because it is based on sound science.”

“We presented the results of the first pilot to management and they were impressed because the level of data and information the TSP/PSP team was able to provide.”
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Lessons Learned

What’s different about TSP results from Mexico?
• Nothing! Projects come in on time, on budget, with high quality.

What’s different about implementing TSP?
• Scaling to roll out to a nation is different than for a company.
• Need native Spanish speaking instructors and coaches.
• Not much initial resistance from developers.
• Many young and inexperienced developers need coaching attention.
• Difficult to get enough time for training.

How do the new approaches work?
• Teams taking PSP Fundamentals
  – Get to launch more quickly
  – Take good data and get good results
  – Don’t achieve the highest quality levels
# Implementation Times

<table>
<thead>
<tr>
<th>Task</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q5</th>
<th>Q6</th>
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</thead>
<tbody>
<tr>
<td>Hold executive training/kickoff session</td>
<td>X</td>
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<td></td>
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<tr>
<td>Select participants, develop schedule</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Train managers, engineers, instructors</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conduct TSP pilots</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Train transition agents</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Plan and initiate roll-out</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Using Fundamentals, the record launch is 9 days after beginning training!
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Conclusions

TSP it works!

We are satisfying the strategic objectives

- Promote software exports.
- Develop human capital.
- Achieve international standards in process capability.

Implementation

- Fundamentals accelerates TSP and project startup.
- National roll out requires a large support structure.
- We can change the world:
  - One country at a time!
  - One company at a time!
  - One project at a time!
  - One developer at a time!
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Next Steps

Each of us has a responsibility!

• Engineers: Continue to do your best work.
• Early Adopters and Early Majority:
  – Tell others about your success.
• Executives
  – Don’t hesitate; do it!
  – Provide the training.
  – Provide the resources.
• Educators
  – Learn TSP and PSP.
  – Teach students disciplined methods.
• SEI
  – Develop the links between TSP and CMMI.
  – Certify TSP organizations
Schedule

Project % Schedule Deviation

TSP Benchmark (2003)
Mexican Initiative
Chaos 1994 (31% cancelled)
Chaos 2004 (18% cancelled)

TSP variation use data range
Chaos has no lower bound data, upper bound at 75%
Effort

Project % Effort Deviation

- Mexican Initiative

TSP variation use data range
Chaos does not report effort
## Quality

<table>
<thead>
<tr>
<th>Measure (TSP)</th>
<th>TSP Benchmark Project Average</th>
<th>Range</th>
<th>Mexican Initiative Project Average</th>
<th>Range</th>
<th>Typical Project Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>System test defects (defects/KLOC)</td>
<td>0.4</td>
<td>0 to 0.9</td>
<td>1.7</td>
<td>0.0 to 6.8</td>
<td>15</td>
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<tr>
<td>Delivered defects (defects/KLOC)</td>
<td>0.06</td>
<td>0 to 0.2</td>
<td>0.5</td>
<td>0.0 to 2.2</td>
<td>7.5</td>
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<tr>
<td>System test effort (% of total effort)</td>
<td>4%</td>
<td>2% to 7%</td>
<td>5.93%</td>
<td>0.25% to 26.2%</td>
<td>40%</td>
</tr>
<tr>
<td>System test schedule (% of total duration)</td>
<td>18%</td>
<td>8% to 25%</td>
<td>6.20%</td>
<td>2.1% to 26.2%</td>
<td>40%</td>
</tr>
<tr>
<td>Duration of system test (days/KLOC)</td>
<td>0.50%</td>
<td>0.2% to 0.8%</td>
<td>5.40%</td>
<td>0.4% to 9.5%</td>
<td>NA</td>
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<tr>
<td>Failure COQ</td>
<td>17%</td>
<td>4% to 38%</td>
<td>15.20%</td>
<td>1.6 to 29.4</td>
<td>50%</td>
</tr>
</tbody>
</table>
The Software Problem

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