TOWA TSP Initiative
- The Ambition to Succeed -

Gerardo López, Towa, CEO & President
Miguel Serrano, MS SPI Solutions, Director
Yuri Ontibón, Towa, Corporate VP of TSP-PSP Strategy
Contents

Introduction

• The Need for Quality
• TSP Introduction Strategy
• A TSP Project Experience
• Current Status
• Next Steps
Introduction

• Mexican initiative to promote the adoption of TSP

– Participants
  • Government
  • Academia led by ITESM
  • SEI
  • Industry
Introduction

• Mexican initiative to promote the adoption of TSP
  – Strengths of the Mexican industry
    • Geographical proximity to the USA
    • A stable macroeconomic environment
    • World class infrastructure with competitive cost
    • Abundant human talent
    • Trade agreements which facilitate the exchange of services with many countries
Introduction

• Mexican initiative to promote the adoption of TSP
  – Goal:
    • Growth software development and IT related services industry
    • Position the Mexican software industry as an international player
    • Developing a world class industry that produces high quality software and services
    • TSP as a differentiator
Introduction

• Who we are?
  – Software development company
  – Operation started on 2004
  – 232 Employees
  – Offices in Monterrey (Mexico) and Mexico City
  – Goal of achieving 3,000 employees over the next 6 years
  – Decided to adopt PSP and TSP as our basic process methodology
Contents

• Introduction
• The Need for Quality
• TSP Introduction Strategy
• A TSP Project Experience
• Current Status
• Next Steps
The need for Quality

• With the growing, quality levels became an issue
• Towa was created with
  ✓ focus on quality and
  ✓ capability to grow fast
• Need to keep best practices while the company is growing
• We strongly believe that quality is the key to achieve our goals
The need for Quality

• The challenge relies on how to get the new generations to understand how to apply the old “good practices” while developing with the new technologies
The need for Quality

• Old good practices:
  ✓ A strong in-house requirements analysis methodology supported by a CASE tool
  ✓ Careful personal reviews of code and products
  ✓ Quality focus based on work products inspections performed by an experimented coach
  ✓ Design and Coding standards that facilitate its understanding
  ✓ Implementation of “reusable models” that encapsulate the main expected functionality
  ✓ Provide expert coaching to the team members
The need for Quality

• What PSP/TSP Provides?:
  ❑ A well defined process
    – Steps to create the product
    – Take into account the human nature of making mistakes (insert defects)
    – Include review activities, as well as inspections
  ❑ Collect data during the execution of the task.
    – Aid for making good estimations and planning
    – Aid for managing projects adequately
    – Aid for predict future performance
    – Key to perpetuate the work with “good practices”
The need for Quality

• The Process for Component Implementation:

Understand  Design  Code  Test
The need for Quality

• The Process:
  - Understand and Plan
  - High Level Design
  - Code and Compile
  - Prepare Test
  - Detailed Design
  - Execute Test
The need for Quality

• The Process:
  - Understand and Plan
  - High Level Design
  - Code and Compile
  - Prepare Test
  - Quality Control
  - Detailed Design
  - Execute Test
  - Post-mortem
  - Review
  - Inspection
  - Verification
  - Review
  - Inspection
  - Review
  - Inspection
  - Verification
Contents

• Introduction
• The Need for Quality
→ TSP Introduction Strategy
• A TSP Project Experience
• Current Status
• Next Steps
TSP Introduction Strategy

• Commit ourselves with this process:
  □ Firmly believing that (PSP &) TSP is the right path
  □ Continuously talk about what we are doing
  □ Train our teams constantly
  □ Buy as many books as possible about the topic
  □ Discuss with customers what we are doing
TSP Introduction Strategy

• Commit ourselves with this process:
  ☐ Commit
    ✓ to ourselves and
    ✓ to our customers
    about our goals for quality and PSP/TSP
  ☐ Disseminate these ideas
    ✓ with other organizations,
    ✓ with clients and
    ✓ even with competitors
  ☐ Once we have created a significant mass of “believers”, implementation is going to evolve more naturally and become easier
TSP Introduction Strategy

• Apply our former ideas and methodologies mixed with the PSP/TSP concepts - tailoring PSP for adapting to:
  ✓ Information System Design (Requirements Specification)
  ✓ Computer System Design (Technical Specification)
  ✓ Implementation (Component Design, Code, Unit Test & Systems Integration)
  ✓ System Testing
TSP Introduction Strategy

- Development of data processing applications:
  - Information System Design (Requirements Specification)
  - Computer System Design (Technical Specification)
  - Implementation (Component Design, Code, Unit Test & Systems Integration)
TSP Introduction Strategy

- Development of data processing applications:
  - Implementation (Component Design, Code, Unit Test & Systems Integration)
  - Computer System Design (Technical Specification)
  - Information System Design (Requirements Specification)

- Process Scripts (PSPs):
  - Specification of Functions
  - Specification of System Components
  - Component Design, Coding & Unit Testing (Programming Task)
TSP Introduction Strategy

- All Project (No pilot project)
- Train PSP Instructors (9) and TSP Coaches (16)
- Train every team
- Adapt PSP (type of applications & technology)
- **Adapt to a never ending training environment**
- Develop an Integral SW Tool (TSP + ???)
- Align engineering practices
- Align human capital practices
- Align management practices

We are just starting, we have a long way to go
Contents

• Introduction
• The Need for Quality
• TSP Introduction Strategy

A TSP Project Experience

• Current Status
• Next Steps
A TSP Project Experience

• Project name: “Orbita”
• Client: Multipack
• Objective: Business Operating System
• Size: 55,000 hours

• Management team:
  • Requirement Specifications Manager
  • Design Manager
  • Code Manager
  • TSP Implementation Manager
A TSP Project Experience

• We won the project competing with some of the most prestigious software development companies in Mexico
A TSP Project Experience

• Quality plan - Requirements Specification:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Def Inj/Hr</th>
<th>Yield</th>
<th>Def Inj/KLOC</th>
<th>Def Rem/KLOC</th>
<th>Def Residual/KLOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLANREQ Planning</td>
<td>0</td>
<td>0%</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>REQELI Requirement Elicitation</td>
<td>0</td>
<td>0%</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>REQUCD User Concept Diagram Creation</td>
<td>0.25</td>
<td>0%</td>
<td>0.198</td>
<td>0.000</td>
<td>0.198</td>
</tr>
<tr>
<td>REQUCR User Concept Diagram Review</td>
<td>0.025</td>
<td>50%</td>
<td>0.010</td>
<td>0.104</td>
<td>0.104</td>
</tr>
<tr>
<td>REQUCCI User Concept Diagram Internal Inspection</td>
<td>0</td>
<td>65%</td>
<td>0.000</td>
<td>0.068</td>
<td>0.036</td>
</tr>
<tr>
<td>REQUCCI User Concept Diagram Coach Inspection</td>
<td>0</td>
<td>70%</td>
<td>0.000</td>
<td>0.026</td>
<td>0.011</td>
</tr>
<tr>
<td>REQUCUI User Concept Diagram User Inspection</td>
<td>0</td>
<td>70%</td>
<td>0.000</td>
<td>0.008</td>
<td>0.003</td>
</tr>
<tr>
<td>REQS Software Requirement Specification</td>
<td>0.25</td>
<td>0%</td>
<td>1.062</td>
<td>0.000</td>
<td>1.065</td>
</tr>
<tr>
<td>REQSR Software Requirement Specification Review</td>
<td>0.025</td>
<td>50%</td>
<td>0.053</td>
<td>0.559</td>
<td>0.559</td>
</tr>
<tr>
<td>REQSI Software Requirement Internal Inspection</td>
<td>0</td>
<td>65%</td>
<td>0.000</td>
<td>0.364</td>
<td>0.196</td>
</tr>
<tr>
<td>REQSCI Software Requirement Coach Inspection</td>
<td>0</td>
<td>70%</td>
<td>0.000</td>
<td>0.137</td>
<td>0.059</td>
</tr>
<tr>
<td>REQSU Software Requirement User Inspection</td>
<td>0</td>
<td>70%</td>
<td>0.000</td>
<td>0.041</td>
<td>0.018</td>
</tr>
<tr>
<td>PMREQ Postmortem</td>
<td>0</td>
<td>0%</td>
<td>0.000</td>
<td>0.000</td>
<td>0.018</td>
</tr>
</tbody>
</table>
A TSP Project Experience

- Quality plan - Design:

- Planning

- High Level Functional Design

- High Level Functional Design Review

- High Level Functional Coach Inspection

- High Level Functional User Inspection

- Detail Level Functional Design

- Detail Level Functional Design Review

- Detail Level Functional Design Internal Inspection

- Detail Level Functional Coach Inspection

- Quality Control

- Postmortem
A TSP Project Experience

• Quality plan - Code:

• Expected Defects in Product Delivered: 0.06 Def/KLOC (5 Sigma)
A TSP Project Experience

• Defect Analysis

Number of Defects - Requirements Specification

- Incomplete Item: 43%
- Incorrect Item: 26%
- User Definition Change: 12%
- Ambiguous Statement: 3%
- Applicable Stdrds Not met: 1%
- Confusing Items: 9%
- Illogical Item: 1%
- Redundant Items: 4%
- Not Traceable: 1%

Number of Defects - Requirements Specification

- Change: 12%
- Ambiguous Statement: 3%
- Applicable Stdrds Not met: 1%
- Confusing Items: 9%
- Illogical Item: 1%
- Redundant Items: 4%
- Not Traceable: 1%
- User Definition Change: 12%
- Incomplete Item: 43%
- Incorrect Item: 26%
- User Definition Change: 12%
- Ambiguous Statement: 3%
- Applicable Stdrds Not met: 1%
- Confusing Items: 9%
- Illogical Item: 1%
- Redundant Items: 4%
- Not Traceable: 1%

A TSP Project Experience

- Defect Analysis

Defect Removing Time - Requirements Specification

- Ambiguous Statement: 1%
- Confusing Items: 5%
- Illogical Item: 1%
- Applicable Standards Not Met: 0%
- Incomplete Item: 23%
- Incorrect Item: 13%
- User Definition Change: 55%
- Not Traceable: 1%
- Redundant Items: 1%
A TSP Project Experience

• Defect Analysis

![Pie chart showing the distribution of defects in design: Incorrect Item 45%, Incomplete Item 33%, Confusing Items 9%, Illogical Items 1%, Not Traceable 1%, Redundant Items 1%, Applicable Standards Not Met 2%, User Definition Change 7%, Non-verifiable Item 0%]
A TSP Project Experience

• Defect Analysis

Defect Removing Time - Design

- User Definition Change: 31%
- Incomplete Item: 34%
- Incorrect Item: 27%
- Redundant Items: 1%
- Not Traceable: 0%
- Non-verifiable Item: 0%
- Confusing Items: 4%
- Applicable Stdrds Not met: 2%
- Illogical Item: 0%

Total Defect Removing Time: 253 hrs
A TSP Project Experience

• Defect Analysis – Actions taken
  • Adding specific items to the initial checklist
  • Implementation of a format for recording the information collected
  • Sharing information with the client, they took actions to better organize their ideas
  • Include a new phase to our requirements process
A TSP Project Experience

- Defect Analysis
A TSP Project Experience

• Defect Analysis

Removing Time / Def - Removing Phase - Design

<table>
<thead>
<tr>
<th>Component</th>
<th>Min / Def</th>
</tr>
</thead>
<tbody>
<tr>
<td>HLFD</td>
<td>3</td>
</tr>
<tr>
<td>HLFDR</td>
<td>4</td>
</tr>
<tr>
<td>HLFDCI</td>
<td>5</td>
</tr>
<tr>
<td>HLFDU</td>
<td>6</td>
</tr>
<tr>
<td>DLFD</td>
<td>7</td>
</tr>
<tr>
<td>DLFDR</td>
<td>8</td>
</tr>
<tr>
<td>DLFDII</td>
<td>9</td>
</tr>
<tr>
<td>DLFDCI</td>
<td>10</td>
</tr>
<tr>
<td>QCFD</td>
<td>11</td>
</tr>
<tr>
<td>DLFDA</td>
<td>12</td>
</tr>
<tr>
<td>DESDEL</td>
<td>13</td>
</tr>
</tbody>
</table>
A TSP Project Experience

• Defect Analysis – Actions taken
  • Getting the team to pay special attention to removing defects early in the process.
A TSP Project Experience

• Status Information

Cumulative Plan vs. Actual Hrs

Cumulative Earn Value
Contents

• Introduction
• The Need for Quality
• TSP Introduction Strategy
• A TSP Project Experience
  ➡ Current Status
• Next Steps
Current Status

• Implementation Status
  – TSP current capabilities
    • 20 PSP Certified Developers
    • 5 PSP Authorized Instructors
    • 8 TSP Trained Coaches
  – By end 2008
    • 16 Certified TSP coaches
    • 9 Authorized PSP instructor
Current Status

• Challenges
  • We have the commitment to achieve the highest quality levels possible
  • Fast growing
  • When we achieve the middle goal of 500 members, we will focus on the USA market
  • The resistance to change is huge
  • Team work culture
Contents

• Introduction
• The Need for Quality
• TSP Introduction Strategy
• A TSP Project Experience
• Current Status

Next Steps
Next Steps

- Train and certify as PSP Developer most of organization developers
- Train enough PSP instructors and TSP coaches
- PSP/TSP should become a strategic tool for supporting our growth
- Develop TSP tools integrated to our systems
- Working together with Academia and the Mexican government
Next Steps

• We are committed to promoting PSP and TSP and helping the Mexican industry earn a distinction for its quality levels

• Our goal is to give Mexico worldwide recognition for achieving best software quality levels