Predictors of Adoption of Measurement Tools

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CMMI fared well in the U.S., but what about Mexico?
92% of Mexican software companies are small/medium-sized (< 100 people) and average process capability level is 0.9 (Oktaba 2006)
Only 3 Mexican companies have achieved level 2; 33 are level 1
Modelo de Procesos para la Industria de Software (MoProSoft)

<table>
<thead>
<tr>
<th></th>
<th>Adequate for low-maturity SMEs</th>
<th>Inexpensive to adopt</th>
<th>Permissible as a national standard</th>
<th>Specific for SW dev. and maint.</th>
<th>Based on int. recognized practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO9000:2000</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>CMM/CMMI</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>ISO/IEC 12207</td>
<td>?</td>
<td>?</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>ISO/IEC 15504</td>
<td>?</td>
<td>?</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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</table>

Culture of Technology
supply side/developer-based

- Product architecture often mirrors organizational architecture
- Technology is not culturally, morally, and politically value neutral (Pacey 1983)
  - Snowmobile must fit into a pattern of activity which belongs to a particular lifestyle and set of values

Example: Raytheon Legacy

- American Appliance Company (1922)
- Submarine Signal Corporation (1946)
- Raytheon Manufacturing Company (1959)
- Beech Aircraft (1980)
- Hughes/General Dynamics Missiles (1992)

Organizational culture is influenced by
- Legacy processes
- Customer demands
- Product/systems delivered
- Geographic location
  - Etc.

What Makes measurement systems Adoptable? 
(survey Qs)

- Well documented
- Trialability
- Low barrier of entry
- Transparency
- Demonstrates value
- Variety of incentives

- Tailorable
- Information freshness
- Relative advantage
- Compatibility
- On-going peer support
- Credibility

- Agility
- Flexibility
- Failure modes
- Enabled by IT
- Data validity/integrity
Ranking of Adoption Attributes (n=35)

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trialability</td>
<td>1.57</td>
</tr>
<tr>
<td>Relative_Advantage</td>
<td>1.77</td>
</tr>
<tr>
<td>Variety_of_Incentives</td>
<td>1.89</td>
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<tr>
<td>On-going_Peer_Support</td>
<td>1.97</td>
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<tr>
<td>Tailorable</td>
<td>2.11</td>
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<tr>
<td>Compatibility</td>
<td>2.23</td>
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<tr>
<td>Transparency</td>
<td>2.23</td>
</tr>
<tr>
<td>Information_Freshness</td>
<td>2.29</td>
</tr>
<tr>
<td>Low_Barrier_of_Entry</td>
<td>2.29</td>
</tr>
<tr>
<td>Demonstrates_value</td>
<td>2.4</td>
</tr>
<tr>
<td>Credibility</td>
<td>2.49</td>
</tr>
<tr>
<td>Well_Documented</td>
<td>2.63</td>
</tr>
</tbody>
</table>

Legend:
- Attractive
- One-dimensional
- Must-be
COSYSMO Adoption Process

**Call for Participation**

**Check Relevance / Informal Mapping**

**Train Champion**

**Understand inputs and identify pilot programs**

= V&V opportunity

**Informal mapping at the WBS level**

**Test run Industry Calibrated model**

**Tailor COSYSMO to organization**

**Training for Users**

**Local Calibration**

**Large-scale rollout to other projects**

Historical Data Collection

**Institutionalization / adoption**

Impact of Local Calibration at BAE Systems


http://lean.mit.edu
Next Steps

• Diagnose organizational culture characteristics that lead to successful adoption of new processes
• Complete case study on Raytheon’s successful “Enterprise Dashboard”
• Disseminate successful adoption attributes and influence future tool development

Goal: to improve the rate of adoption of new process improvement methods & tools within the LAI Consortium