A Strategy for Software Process Improvement in Brazilian Companies

SUMMARY

1. Introduction
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3. mps Model
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Projeto mps Br – melhoria de processo do software Brasileiro
Project Bspi – Brazilian software process improvement
**SOFTEX – Society for Promoting the Brazilian Software Excellence** (www.softex.br)

- SOFTEX is a private not-for-profit organization which fosters entrepreneurship and entrepreneurial development initiatives, financing and funding activities, and business development in Brazil and abroad, aiming at promoting competitiveness of the Brazilian Software Industry.

- SOFTEX Society, headquartered in Campinas, acts through its 31 SOFTEX Agents, distributed among 23 cities in 13 Brazilian states. There are more than 1300 associated software companies.
Comparing Process Capabilities

• In Brazil, software process improvement concern has emerged over the past twelve years, but local firms have favored the ISO 9000

• In 2003, India had 32 firms that have reached level 5, CMM highest level, China only had one thus far and Brazil had none

• Related to the CMM, most Chinese and Brazilian firms are not at a high enough level of process maturity to compete with Indian firms

Source: Slicing the Knowledge-based Economy in Brazil, China and India: a tale of 3 software industries [MIT, 2003]
### Software Process in Brazil – Firms that Have Reached ISO 90000 and CMM

<table>
<thead>
<tr>
<th></th>
<th>1997</th>
<th>1999</th>
<th>2001</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ISO 9000 Certification</strong></td>
<td>102</td>
<td>206</td>
<td>167</td>
<td>214</td>
</tr>
<tr>
<td><strong>CMM (SEI) Appraisal</strong></td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>Level 5</td>
<td>-</td>
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<tr>
<td>Level 4</td>
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<td>1</td>
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<tr>
<td>Level 3</td>
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<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Level 2</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>24</td>
</tr>
</tbody>
</table>

Source: MCT/SEITEC
The Excellence Problem: How to Reach CMM Levels 4 & 5 in Brazil?

- At the top of the pyramid are the software export firms and other large organizations in Brazil which aim to reach the highest levels of maturity (CMM levels 4 & 5), authorized by SEI – Software Engineering Institute. Here cost is not a critical factor.

- To address this problem, each firm will spend 4 to 10 years with a cost of hundreds of thousands dollars. Here process improvement is focused on customized services (SBM - Specific Business Model).

- “Brazilian Professional Qualification on CMMI Project”, coordinated by SOFTEX, aims (June 2004 - June 2006):
  - to qualify 5 SCAMPI Lead-Appraisers and 2 CMMI Instructors, authorized by SEI, in partnership with a SEI Partner.
  - to implement a 360 hours CMMI Course (Distance Education Environment) seeking to qualify 50 CMMI experts, in partnership with a Brazilian University.
The Inclusion Problem: How to Improve Software Process in Brazilian SMEs?

- At the bottom of the pyramid is the mass of micro, small and medium-sized software firms (SMEs) which must improve their software process. Here cost is a critical factor.

- To address this problem, each firm will spend 2 to 4 years to adapt to a Process Reference Model, such as CMMI levels 2 & 3, with a cost of tens of thousands dollars. Here process improvement could be focused on packaged services (CBM - Cooperative Business Model).

“Brazilian software process improvement Project (mps Br)”, coordinated by SOFTEX, aims to create a Process Reference Model (MR mps or mps model) and to spread it based on shared costs:

- into 120 firms until June 2006
- in additional 160 firms in the next two years
mps Br Project: Time Schedule

- **Dec 2003 - Mar 2004**: Project Organization (mps Br)
- **Apr - Jun 2004**: Model Improvement (MR mps)

- **Jul - Dec 2004**: Model Implementation in Groups of Firms (focused on CBM - Cooperative Business Model)
- **Jan - Jun 2005**: Model Implementation in Groups of Firms (focused on CBM)
- **Jul - Dec 2005**: Model Implementation in Groups of Firms (focused on CBM)
- **Jan - Jun 2006**: Model Implementation in Groups of Firms (focused on CBM)
mps Br Project: Organizational Structure

• **Project Team (mps Br)**
  – SOFTEX Society (Coordination)
  – UFRJ/COPPE & SOFTEX Agent (Rio de Janeiro, RJ)
  – CenPRA & SOFTEX Agent (Campinas, SP)
  – CESAR & SOFTEX Agent (Recife, PE)
  – ABNT/SC21:10 & CELEPAR (Standards and Guides)

• **Model Team (ETM)**
  – Responsible for model improvement and training (courses, tests and certification of persons)

• **Accreditation Forum (FCC)**
  – Responsible for certification of the competence of the organizations conducting mps Process Improvement Services (PIS) and Conformity Assessment Services (CAS)
Software Process Improvement Business Model (MN mps)

mps Br Project

Agreement

PIS & CAS (*)

Contract

CBM (*)

Contract

SBM (*)

(*) PIS – mps Process Improvement Services Org.
CAS – mps Conformity Assessment Services Org.
SBM – mps Specific Business Model (customized services)
CBM – mps Cooperative Business Model (packaged services)
Software Process Improvement Reference Model (MR mps)
mps Model: 3 Domains

Software Process Improvement Reference Model (MR mps)

Maturity Levels

Process Assessment

PROJECT DOMAIN

SERVICE DOMAIN

FIRM DOMAIN

Process Improvement Services Org.

PIS 1

PIS 2

PIS n

Conformity Assessment Services Org.

CAS 1

CAS 2

CAS n

Firm 1

Firm 2

Firm n

12207 & AMDs 15504 (SPICE) CMMI

General Guide

Acquisition Guide

Assessment Guide

Projeto mps Br – melhoria de processo do software Brasileiro
Project Bspi – Brazilian software process improvement
mps Model: 7 Maturity Levels

• mps Model complies with the following standards:
  – the software processes defined in ISO/IEC 12207
  – the process reference model defined in ISO/IEC 12207 AMD1
  – the process assessment model defined in ISO/IEC 15504 and its use in the two contexts of:
    • process improvement (process dimension)
    • process capability determination (capability dimension)

• The intersection of these two dimensions defines process maturity

• mps Model has 7 maturity levels (compatible with the 5 levels in CMMI model):
  
  A - Optimizing       B - Quantitatively Managed
  C - Defined             D - Largely Defined     E - Partially Defined
  F - Managed           G - Partially Managed
## mps Model: Process Assessment

(The certificate is valid for a period of **2 years**)

<table>
<thead>
<tr>
<th>Rating Scale</th>
<th>Process Attribute</th>
<th>Values</th>
</tr>
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</table>
| Fully achieved | * There is evidence of a complete and systematic approach to, and full achievement of, the defined attribute in the assessed process  
                 * No significant weakness related to this attribute exist in the assessed process | > 85% a 100%   |
| Largely achieved| * There is evidence of a systematic approach to, and significant achievement of, the defined attribute in the assessed process  
                 * Some weakness related to this attribute may exist in the assessed process | > 50% a 85%    |
| Partially achieved| * There is some evidence of an approach to, and some achievement of, the defined attribute in the assessed process  
                 * Some aspects of achievement of the attribute may be unpredictable | > 15% to 50%   |
| Not achieved   | * There is little or no evidence of achievement of the defined attribute in the assessed process | 0 to 15%       |

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Projeto mps Br – melhoria de processo do software Brasileiro  
Project Bspi – Brazilian software process improvement
mps Model: Pilot Training

- **mps Introduction Course**
  - Course (8 hours) on mps Project, standards (ISO/IEC 12207 & AMDs and ISO/IEC 15504), and models (CMMI and mps processes and practices)

- **mps Process Improvement Course & Test**
  - Aug. 9, 2004: Test in 10 Brazilian cities (53 approved)
  - Oct. 18 and Dec. 3, 2004: Next tests
  - Course (16 hours) on standards ISO/IEC 12207 & AMDs (4 hours) and ISO/IEC15504 (4 hours), and models CMMI (8 hours) and mps (8 hours)

- **mps Process Assessment Course & Test**
  - Course (24 hours) on the process assessment model based on ISO/IEC 15504
  - There will be a pilot course in the next months and tests in 2005
mps Br Project: Pilot Experiences

• From Dec. 2003 onwards:
  – mps Model was defined and it is being improved to support mps pilot experiences which are being performed with groups of firms in Rio de Janeiro (COPPE/UFRJ and SOFTEX Agent), Campinas (CenPRA and SOFTEX Agent) and Recife (CESAR and SOFTEX Agent)
  – in Rio de Janeiro, COPPE/UFRJ is providing mps Process Improvement Services (PIS) to a group of 18 SMEs, organized by the local SOFTEX Agent (RIOSOFT)

• In 2005 - besides Rio de Janeiro, Campinas and Recife, there will be mps Model implementations in groups of firms in Curitiba, Belo Horizonte, Campina Grande, Brasília, Fortaleza, Goiania, Manaus, Porto Alegre, Ribeirão Preto, Salvador, Vitória and São Paulo
mps Model: 7 Differences

- mps Model complies with standards (ISO/IEC 12207 & AMDs and ISO/IEC 15504) and it is compatible with other models (e.g., CMMI)
- mps Model was created according to the Brazilian reality
- mps Model (due to its 7 maturity levels) provides a better:
  - granularity for the software process improvement, mainly in SMEs
  - visibility of the software process improvement
- mps Conformity Assessment certificate is valid for a period of 2 years
- mps Model definition and both mps Process Improvement Services (PIS) and Conformity Assessment Services (CAS) are based on a strong interaction between universities and firms in Brazil
- mps Process Improvement Services (PIS) and Conformity Assessment Services (CAS) have a fair cost, specially in the mps Cooperative Business Model (CBM)
- mps Model has a great potential to be replied to many cities in Brazil and other countries with similar characteristics, such as in Latin America
Projeto mps Br – melhoria de processo do software Brasileiro
Project Bspi – Brazilian software process improvement
Thank You

Questions?

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Tuesday, October 19, 11.30 to 13.00: **Technical Session 4 - Software Process Improvement in Action**

- “A Strategy for Software Process Improvement in Brazilian Companies”, Kival Weber (SOFTEX)

- “The Capability Road Map – from Quality Management to Process Improvement”, Kevin Daily (QAI Europe)