MPS.BR program and MPS model: Main Results, Benefits and Beneficiaries of Software Process Improvement in Brazil

Gleison Santos-UNIRIO; Marcos Kalinowski, Ana Regina Cavalcanti da Rocha, Guilherme Horta Travassos-COPPE/UFRJ; Kival Chaves Weber, José Antonio Antonioni-SOFTEX

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2. MPS.BR program and MPS model: Benefits to the Industry, Government, and University (Triple Helix)
3. Conclusion

‘ICT Process Improvement and AssessmentTrack’ @ QUATIC’2012 – 8th International Conference on the Quality of Information and Communications Technology. Lisbon, Portugal, Sept. 3rd, 2012.
Brazil is one of the countries that invest more in software quality assurance

- In 2010 the most significant increase in software quality assurance budgets were in China (83%) and Brazil (56%), suggesting that emergent economies have investments in ‘quality assurance’ as strategic to their growth and competitiveness advantage

  Ref.: ‘World Quality Report 2010’. Capgemini, Sogeti, and HP study. TI INSIDE online, July 1st 2011

- The main Brazilian investment in software quality assurance is concerned with the MPS.BR Program (or ‘Melhoria de Processo do Software Brasileiro’ in Portuguese) and the MPS Model
  - This nationwide program was created in December 2003 by the Association for Promoting the Brazilian Software Excellence (SOFTEX)
  - SOFTEX is a private nonprofit organization aiming at promoting Brazilian software industry competitiveness
MPS.BR is a long term program (such as CMMI which started as CMM in 1991, based on a 1988 Watts Humphrey’s concept)

The MPS.BR program has two main goals (permanent challenges):

i) a technical goal aiming at establishing and improving continually the MPS model

ii) a business goal aiming at spreading the MPS model use – allowing both SME (small and medium-sized enterprises) and large organizations to achieve the benefits of Software Process Improvement (SPI) aiming at increasing competitiveness
The MPS model is constituted of three main components:

- MR-MPS Reference Model (see MPS General Guide)
- MA-MPS Assessment Method (see MPS Assessment Guide)
- MN-MPS Business Model (see www.softex.br/mpsbr)

MR-MPS and MA-MPS are:

- CMMI-DEV fully compatible
- based on software engineering best practices
- in accordance with both SME and large enterprise realities and needs
<table>
<thead>
<tr>
<th>Levels</th>
<th>Processes</th>
<th>Process Attributes (capabilities)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>(no new processes are added)</td>
<td>1.1, 2.1, 2.2, 3.1, 3.2, 4.1, 4.2, 5.1, 5.2 (~ CMMI5)</td>
</tr>
<tr>
<td>B</td>
<td>Project Management (evolution)</td>
<td>1.1, 2.1, 2.2, 3.1, 3.2, 4.1, 4.2 (~ CMMI4)</td>
</tr>
<tr>
<td>C</td>
<td>Decision Management, Risk Management, Development for Reuse</td>
<td>1.1, 2.1, 2.2, 3.1, 3.2 (~ CMMI3)</td>
</tr>
<tr>
<td>D</td>
<td>Requirements Development, Product Design and Construction, Product Integration, Verification, and Validation</td>
<td>1.1, 2.1, 2.2, 3.1, 3.2</td>
</tr>
<tr>
<td>E</td>
<td>Human Resources Management, Process Establishment, Process Assessment and Improvement, Project Management (new outcomes), and Reuse Management</td>
<td>1.1, 2.1, 2.2, 3.1, 3.2</td>
</tr>
<tr>
<td>F</td>
<td>Measurement, Configuration Management, Acquisition, Quality Assurance, and Project Portfolio Management</td>
<td>1.1, 2.1, 2.2 (~ CMMI2)</td>
</tr>
<tr>
<td>G</td>
<td>Requirements Management and Project Management</td>
<td>1.1, 2.1</td>
</tr>
</tbody>
</table>
Since the first offers in 2004, over 5,000 people have attended official MPS courses (C1 - Introduction to MPS.BR, C2 - MPS Implementation, C3 - MPS Assessment, and C4 - MPS Acquisition Process)

- there are 30 trained and authorized instructors to teach these courses

- in 2011 MPS official courses were offered both in Portuguese (Brazil) and Spanish (in Colombia, Mexico and Peru)

There are 17 MPS Implementation Institutions and 12 MPS Assessment Institutions authorized to render MPS services to customers
382 MPS Assessments published at www.softex.br/mpsbr (validity 3 years): 70% SME and 30% large organizations

Assessments by levels of the MPS model

- 2004-2007=72
- 2008-2011=273
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MPS.BR program and MPS model: Benefits to the Industry

- The MPS model adoption by Brazilian organizations led to the interest in understanding the benefits brought to the Industry both qualitatively and quantitatively.

- In 2008, SOFTEX hired COPPE/UFRJ’s Experimental Software Engineering Group to model the iMPS project – ‘Information to Monitor and Provide Evidence Regarding Performance Variation of Software Organizations that Adopted the MPS Model’, and to support the conduct of yearly iMPS trials.
In 2011 iMPS trial, 133 electronic questionnaires from different companies were received

- the organizations satisfaction with the MPS model was evident, with approximately 97% of them reporting to be totally or partially satisfied with the MPS model

- the characterization has indicated positive correlation between the MPS model organizations maturity level and number of projects

- in the performance variation analysis, it was possible to identify that organizations remaining persistent in the use of software engineering practices have
  
  • more customers
  • develop more projects
  • have a greater number of employees
  • deal with larger projects
  • show higher estimation accuracy
iMPS surveys: Performance Results of Organizations that Adopted the MPS Model

Details regarding the iMPS survey results are available in Portuguese, Spanish, and English at <www.softex.br/mpsbr>
MPS.BR program and MPS model: Benefits to the Government

In the term 2007-2010 there were Brazilian Federal Government industrial policies aiming at stimulating the adoption of software engineering best practices by companies:

– the goal was to implement software engineering best practices in 400 companies, mainly SME, by means of MPS Assessments and CMMI Appraisals
  • nowadays, there was in Brazil over 500 software companies that adopted these best practices: 380 MPS Assessments and 150 CMMI Appraisals
    – among these there are some Complementary MPS Assessments after CMMI Appraisals and some Joint MPS-CMMI Appraisals

– according to a recent study supported by UNESCO, there was in Brazil an enterprise migration from the general ISO9001 quality approach to approaches focused on SPI such as MPS or CMMI
MPS.BR program and MPS model: Benefits to the University

- The University also was beneficiary both
  - contributing to the transfer of software engineering knowledge to the Industry
  - benefiting itself with new challenges and problems to solve in its research and education activities

- This way we do believe University have a key role to help the Industry, acting as a bridge between the ‘state of art’ and the ‘state of practice’ in software engineering
  - the MPS.BR program and the MPS model have explicitly promoted this non-trivial and important University-Industry relationship in Brazil
MPS Model Citations in Papers (Brazilian Symposium on Software Quality - SBQS)

– After 2005 (first MPS citation) more than 50% of the papers at least mention CMMI or MPS models as ‘references’; in 2009 this ratio was 83%

– In 2008 and 2009 there were more papers using MPS as ‘ground’ for their research or representing MPS practical ‘use evidence’ than using CMMI
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Conclusion

- This paper/presentation updated and summarized the main results, benefits and beneficiaries of the MPS.BR program and the MPS model focusing on the Government, Industry, and University (Triple Helix)

- In 2012 it has been planned the following:
  - to expand MPS implementations and assessments in Brazil and to introduce them in Latin American and the Caribbean (LAC) countries, which started in Colombia, Mexico and Peru under the umbrella of the RELAIS Project (‘Red Latinoamericana de la Indústria del Software’ in Spanish), supported by the IADB/MIF
  - to make available e-learning facilities offering MPS official courses (C1/EAD – Introduction to MPS.BR and C2/EAD – MPS Implementation) and exams in Portuguese and Spanish
  - to establish an explicit mapping of the MPS model with the new ISO/IEC 29110 for VSE – Very Small Entities
  - to release an MPS Services General Guide (MR-MPS-SV) based on ISO/IEC 20000, ITIL and CMMI-SVC, in parallel with the existing MPS Software General Guide (MR-MPS-SW), aiming at be able to assess both just using the MPS Assessment Guide
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✓ Thank you very much

Questions ?