A Nationwide Program for Software Process Improvement in Brazil

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Summary

- Motivation
- MPS.BR Program
- MPS Model
  - MPS Reference Model
  - MPS Assessment Method
  - MPS Business Model
- Adoption and dissemination of the MPS Model in the Brazilian software industry
- Conclusions
Continuous improvement is key to increase software organizations competitive capabilities.

Organizations struggle to implement Software Process Improvements (SPI), especially Small and Medium-size Enterprises (SME).
Motivation

- 73% of Brazilian software industry (more than 6,000 organizations) is constituted of SMEs.

- Few Brazilian software organizations reported CMMI official software process appraisals (approx. 1/4 of countries like China and India).

- It is imperative to increase software development capabilities of Brazilian organizations.
MPS.BR Program

- A nationwide initiative coordinated by the Association for Promoting the Brazilian Software Excellence (SOFTEX).

- The main goal was to develop and disseminate a Brazilian software process model (named MPS Model).

- The expected benefit was to establish a feasible SPI implementation and assessment pathway for organizations to thrive.
The MPS.BR Program Structure units are the following:

- MPS.BR Program Team.
- MPS Technical Model Team.
- MPS Accreditation Forum.
MPS Model

- The ISO/IEC 12207 and ISO/IEC 15504 were used as the technical base elements for defining the MPS Model Components.

- The CMMI was also considered as a complementary technical base element for the MPS Model processes definition.
The MPS Model is constituted of three main components:

- The MPS Reference Model.
- The MPS Assessment Method.
- The MPS Business Model.
MPS Model Components

- MPS Reference Model
  - MPS General Guide
  - MPS Acquisition Guide
  - MPS Implementation Guide
- MPS Assessment Method
  - MPS Assessment Guide
- MPS Business Model
  - MPS Program Documents
The MPS Reference Model (MR-MPS) is documented in the form of three guides:

- The MPS General Guide.
- The MPS Acquisition Guide.
- The MPS Implementation Guide.

The MR-MPS is conformant to ISO/IEC 15504 since it fulfils the requirements for a PRM defined in ISO/IEC 15504-2.
The MR-MPS processes are described in terms of their specific purpose and outcomes used to evaluate specific process implementation.

Each process has unique process descriptions and identification and the set of process outcomes are necessary and sufficient to achieve the purpose of the process.

The MR-MPS processes are an adaptation of the ISO/IEC 12207 Amd 1 & Amd 2 processes and the CMMI-DEV process areas.
The MPS General Guide also provides a definition of scope and composition of MR-MPS process profiles for a declared level of organizational maturity level.

- A maturity level consists of process outcomes and process attributes achievement results for a predefined set of processes.

- The MR-MPS maturity levels are defined in two dimensions: process capabilities dimension and process dimension.
The measure of capability is based upon a set of process attributes (PA) based on the ISO/IEC 15504-2 process attributes used to define capability levels.

The MR-MPS defines nine PA:
- PA 1.1 (process performance attribute).
- PA 2.1 (performance management attribute).
- PA 2.2 (work product management attribute).
- PA 3.1 (process definition attribute).
- PA 3.2 (process deployment attribute).
- PA 4.1 (process measurement attribute).
- PA 4.2 (process control attribute).
- PA 5.1 (process innovation attribute).
- PA 5.2 (process optimization attribute).
**MPS Reference Model**

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<tr>
<th>ML</th>
<th>Processes</th>
<th>PA</th>
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<tr>
<td>A</td>
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<td>Project Management (evolution)</td>
<td>1.1, 2.1, 2.2, 3.1, 3.2, 4.1*, 4.2*</td>
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<td>Development for Reuse</td>
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<td>D</td>
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<td>1.1, 2.1</td>
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<td>Project Management</td>
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*These PAs are applicable only to selected processes. All the other PAs must be applied to all processes.*
The MPS Model contains other 2 guides:

- The MPS Acquisition Guide describes an acquisition process for software and related services.

- The MPS Implementation Guide provides technical guidance for implementing the seven MR-MPS levels.
According to ISO/IEC 15504-2, an assessment should be carried out against a defined assessment input utilizing conformant Process Assessment Model(s) related to one or more conformant or compliant Process Reference Model(s).
In order to satisfy ISO/IEC 15504-2 requirements for a Process Assessment Model, the MPS Technical Model Team defined the MPS Assessment Method (MA-MPS) and documented it in the form of the MPS Assessment Guide.

This guide also describes the assessment process defined to support the application of the MA-MPS.
The objective of the assessment method MA-MPS described in the MPS Assessment Guide is to verify the maturity of an organization unit in the execution of its software processes.

The assessment process describes the set of activities to be executed to achieve this objective.
The MA-MPS assessment process has four subprocesses:
- Contracting the assessment.
- Preparing to perform the assessment.
- Performing the assessment.
- Recording assessment output.

Each process outcome and process attribute achievement result shall be rated using a 6-point scale.
- The six points are designated as F, L, P, NY, OS, NA for Fully Achieved, Largely Achieved, Partially Achieved, Not Yet, Out of Scope and Not Achieved.
MPS Business Model

- Developed and integrated to the MPS Model aiming to support its adoption and dissemination by defining business rules for:
  - Training SPI practitioners.
  - Implementing the MPS Model by organizations that provide MPS Model based implementation services, namely an accredited MPS Implementation Institution (MPS II).
  - Executing process assessments by organizations that provide MPS assessment services (an accredited MPS AI).
  - Organizing groups of enterprises to provide MPS based implementation and assessment services.
Adoption and dissemination of the MPS Model in the Brazilian software industry

- More than 3,000 people attended MPS Model courses in different cities of Brazil.

- 18 organizations were accredited to provide MPS Model-based implementation services.

- 4 organizations were accredited to provide MPS Model-based assessment services in different regions of Brazil.

- 93 organizations are implementing the MPS Model according to the MPS Cooperative Business Model coordinated by 15 different CIGE in 13 cities.

- 40 Brazilian organizations executed MPS Model-based assessments in different cities.
Conclusions

- By implementing the MPS Model, organizations can escalate maturity levels more easily since few processes are needed to be implemented at each MR-MPS maturity level.

- Organizations that implement MPS Model are eligible to obtain financial support for SPI implementation and assessment initiatives.

- Performing MPS Model based assessment is 60% cheaper than other assessment models.

- Benefits of MPS Model based SPI initiatives are visible in a shorter time frame and at feasible implementation and assessment costs, especially for SMEs.
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