



Manifesto for the proposal of

NESSI Working Group on Business Process Management¹

Presented by

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¹ The title of this NWG is still under discussion. We look for more suitable and “innovative” name that would express the real objectives of this NWG. The name will be finally decided during the next SC meeting.

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1. Motivation

During the last decade business process management (BPM) and workflow management (WfM) emerged as technology foundations for companies to manage some or all of their operations and process-flows using standards and integration methods. However, business (small and large) are quickly realizing that they not able to easily monitor, adapt and change their processes dynamically without incurring a significant cost of tear-down, re-integration and restructuring of the processes and operations. This inflexibility is causing businesses tremendous inertia in changing business models or trying out new ones to adapt to changing market conditions. The challenges are compounded further because businesses are heavily relying on their suppliers, partners and dealers and business process management needs to be driven into the supply and value chains. In essence dynamically changing business processes with minimal risk to current operations is becoming harder because of outdated client-server models, inflexible point-to-point integration methods and disconnected business process management systems.

Despite many advantages offered by BPM/WfM methods, current systems are business “agnostic” and do not support domain specific semantics, management or monitoring to enable performance enabled process transformations. The major restrictions and limitations were related to lack of process adaptability, process generalisation, inflexible management of quality of service parameters, limited monitoring and inefficient mechanisms for analysis of process enactment. BPM/WfM technologies have become a critical component of IT applications, support databases, transaction processing and user interfaces. However, BPM focus over the last decade was more on IT side of the business processes, less on the business aspects, metrics and business-model requirements, and even less on management aspects.

The **motivation** for this working-group is based on closing the current big gaps for enabling flexible business models, transformations and supporting “measurable” model-driven approach to doing business process management efficiently. It also covers the business-IT gap that results in weak support of the whole business process lifecycle. The current systems for doing streamlined business process execution are still weak in the Industry and inappropriate in order to be applied in a real industry environment. With Web Services, better security and industrial strength services engineering, the necessary foundations will be laid to support measurable business process management methods, flexible composition of services and tools for enabling a variety of business models.

2. Objectives and Scope

The main aim of this NWG is to create a unified strategy for applying BPM in order to solve real, cross-domain challenges. This strategy will be driven by Common European Research Agenda [2] and will follow the ideas and challenges elaborated in “Challenge 1: Pervasive and Trusted Network and Service Infrastructures” of FP7 included in [1]. In order to achieve this NWG will focus on practical aspects of successful applying BPM to define appropriate business ecosystems (usually domain specific). In order to achieve it this work group will support research and technology for the following:

- **Support roundtrip management of business processes.**

Linking business level to IT level and vice versa. Provides methodologies, mechanisms and tools to simplify the way of linking individual phases of the whole business process lifecycle starting from business level (i.e. strategic design, process modelling, definition), going into IT level (i.e. implementation, simulation, testing, enactment, monitoring) and coming back to business level (process analysis, re-design,

improvement). In particular, it includes adaptive process enactment with advanced exception handling mechanisms, QoS-aware and SLA based monitoring, process and information analytics for process improvement, service lead business process re-design. Enforce non-functional requirements defined on a business level on the IT level. If possible, provide automatic transformations / links between individual phases of business process lifecycle.

- **Support the knowledge worker in business processes**

Support the spectrum from automatable to manual processes. Involvement of knowledge workers in business processes. Provide various mechanisms and tools to support knowledge workers with the knowledge about processes: what was done (history), what is currently executed (present), what may be done in the next steps (future). Equip knowledge workers with mechanisms to optimise their way of working (e.g. workload balancing) as well as mechanisms to support ad-hoc decisions and other required dynamic changes.

- **Provide solutions to emerging Business Ecosystems and cross-organisational Business processes**

Define high-level coordination models (choreographies). Provide transformations to enable linking to intra-organisational process models and their execution. Validate/define new Business Models for service / process provisioning, adaptation and reselling. Collaborative business process management.

- **Domain specific and cross-domain approaches for BPM**

Standard support. Guidelines. Frameworks for analysis, introduction, management, validation of BPM solutions. Service oriented business process enablement of legacy systems. (Distributed) transaction support (models and approaches).

The work of this NWG should leverage the current standards and knowledge from Object Management Group (OMG) and Business Modelling and Integration (BMI), Workflow Management Coalition (WfMC), Web Services (esp. OASIS and GGF), data exchange formats and standard communication protocols. This working group should steer the process of possible changes and extensions to the existing standards that come as the results of NESSI projects. On the basis of such results this working group should propose, if required, extensions to the existing standards. These extensions should be compliant with the overall NESSI vision and be suitable for all NESSI projects (not just for a particular one).

3. Alignment with NESSI Mission and Objectives

The results of this working group will help developing a visionary NESSI strategy for software and services driven by a common European Strategic Research Agenda (RSA, [6]). In particular, they will (based on the NESSI Mission described in [4]):

- provide European Industry and the Public Sector with efficient services and software infrastructures to improve flexibility, interoperability and quality of business processes and (web) service compositions;
- provide the foundations and best practices for doing business process management that can support multiple business models for cross-domain applications
- provide adaptive, monitorable and measurable processes and business process management systems to enable better business transformation
- manage BPM software and its provision as service oriented utilities;
- establish the technological basis, the strategies and deployment policies to speed up the dynamics of the services ecosystem by providing process adaptability and process generalization features;

- extend and adopt of open standards and open source software as well as the provision of open BPM services;
- apply the best practices and mechanisms in the area of safety and security that result from the other NESSI works.

This NWG will also participate in work on the NESSI Research Agenda presented in [2] based on the five point schema: aware, trust, ubiquitous, alive, and user centrality. In particular, the point “alive software” will be supported by various BPM algorithms to make business process adaptable to dynamic changes, able to re define their definition “on-demand”.

In the area of technology domains (based on NESSI Research Areas described in [4]), specification of the software components and their reference implementations developed within the BPM working group will be a part of Service Integration Layer (i.e. BPM execution engine) and Semantic Layer (i.e. BPM ontology). As was stated earlier, these tools will be able to support appropriate level of such non functional aspects as quality and reliability, security and trust as well as interoperability. Using mechanisms based on service level agreements the BPM tools will also be able to support appropriate level of service management.

4. Topics

In order to satisfy the objectives described in the previous sections, this working group will carry out its research and development covering the following topics²:

- Business Design, Models and Policies
 - Business models for BPM in value and supply-chains
 - Business model driven BPM for Virtual Organizations
 - Sensor based process control (e.g. RFID and others)
 - Web Services driven process composition models
 - Business Policies driven process management
 - Privacy and Security enabled Business Process management
- Business Intelligence and Information Integration
 - Measurement and Metrics
 - Monitoring coupled with Process management
 - Industry domain practices
 - Information gathering and analytics
 - Predictive modelling for process measurement and transformations
- Adaptive System and People-based BPM
 - Adaptive process management
 - Process transformation methods
 - Risk and cost based management for processes
 - Human in the loop based process management
- Adaptive QoS-aware Business Process Operations
 - Adaptive enactment with advanced Exception handling mechanisms
 - SLA based monitoring
 - Dynamic profiling
 - Advanced process administration
- Industry Practices and Standards
 - Customer Relationship management
 - Supply-chain management

² This is an initial list of topics as it may change in the future.

- Value-driven network management
- Transformational practices for Process Services
- Related to selected technology features
 - Security
 - Transaction Support
 - Policy
 - Reliability

At the NESSI level, a part of the listed topics is covered mainly by this working group while the others are just supported by this working group and are of the min interest of the other working groups. The level of participation of this working group in work on the discussed topics is presented in Figure 1.

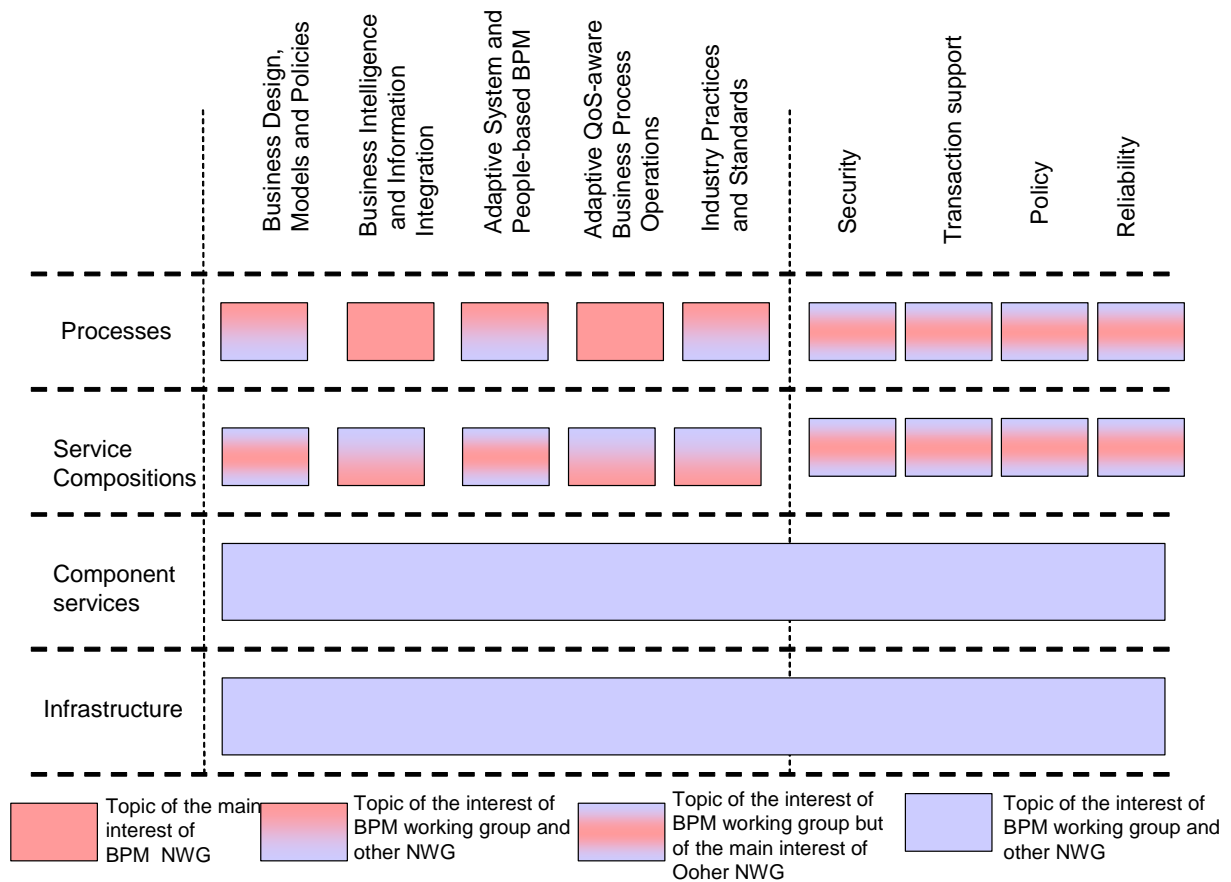


Figure 1. Topics covered by Business Process Management working group

5. Links with other working groups

This NWG will have relationships with the following horizontal NWGs:

- Service Engineering NWG – especially in the area of service compositions, transaction models and approaches as well as SLA based monitoring,
- Service Sciences – in the area of business models and process transformation

In addition the BPM working group will collaborate with other horizontal working groups in the area on topics including ‘New generation of Open Standards for Interoperability’, ‘Core Standards Leverage’ and ‘New generation of licenses’.

Since BPM working group will be a horizontal working group, it will cooperate with most of the other vertical (i.e. domain specific) NESSI working groups. It is planned that BPM working group will act as an expert in the area of business process management providing

solutions in terms of methodologies, architectures and tools. From the other working groups, the BPM working group will collect key requirements / expectations to BPM and gather results of application of BPM solutions.

6. Working group deliverables

There are several types of the expected results of this working group. First of all, the working group will define **methodologies to apply BPM** in order to build appropriate business ecosystems covered by other, horizontal NESSI working groups. That will cover appropriate mappings between BPM and domain ontologies, best practices and other aspects of BPM pragmatics.

The working group will also participate actively in **improving the most popular BPM/Web service standards** such as Business Process Modelling Notation (BPML, now OMG), Web Service Business Process Execution Language from OASIS (WS-BPEL, [7] and [8]), XML Process Definition Language (XPDL, [10]) and Wf-XML Binding (Wf-XML, [11]) both from WfMC. It should be underlined, that the working group, if possible, will avoid defining new standards from scratch.

On the basis of work carried out in individual NESSI projects, this working group will define compliant **open software architectures for (service oriented) BPM** underlying that such systems are just a part of integrated, sophisticated IT systems and the overall NESSI platform. The openness of the proposed architectures will be expressed by ability to integrate new / existing software components at minimum integration cost. To achieve this, the working group will promote standard data exchange formats and well defined application programming interfaces.

On the basis of the defined architectures, the working group will also promote **reference implementations developed** within individual NESSI projects. These implementations will guide other software vendors (developers) how to implement or integrate their own software components properly.

7. Working group lifetime

The working group shall hold 4 meetings per year as a basis for defining orientations, planning and coordinating activities. A monthly management meeting is foreseen as a teleconference. Additional work sessions will be organized as needed by the involved parties. Moreover, sub-working groups shall be created to cover specific parts of the topics covered by the working group.

8. Membership

The working group is currently formed of:

- IBM
- Rodan Systems S.A.
- SAP AG.
- Others

9. WG Methodology and structure

In order to assure appropriate management within the BPM working group as well as successful communication with the other NESSI working groups and bodies, the structure of the working group will follow NESSI recommendations described in [5] (see section 4.2, “Operating structure” of the NESSI WG Governance document).

In addition to the roles presented in the recommendations, we propose an additional sub-committee and two additional roles³:

- **WG Business (Sub)Committee** – this will consist of a core team of experts, some from Industry and some from academia helping provide requirements and advice on current industry and academic disciplines and practices. This steering committee will provide a stronger business and appropriate technology focus to the working-group.
- **WG Chief Research Officer** – this person would be responsible for keeping consistent and coherent all research activities conducted by the working group and all NESSI projects. This person would also be responsible for communication with the representatives of the other working groups and external research bodies (standardization committees, EU representatives, research centres, etc.) to assure appropriate strategy of BPM research activities.
- **WG Chief Development Officer (Chief Architect)** – this person would be responsible for managing all BPM development activities in NESSI (i.e. all NESSI projects). In particular, this person would be responsible for verification of BPM software architectures and reference implementations. This person would also maintain contacts with the representatives of the other working groups gathering from them the most important requirements for improving BPM mechanisms and tools. This person would also assure appropriate communication with the external key software vendors in order to focus NESSI efforts on the most demanding BPM functionality.

The other roles in the working group will be defined on demand. However, at the moment we recommend not to overload the number of specific roles expressed in number of involved people since, from our past experience, such approach may reduce mobility of the working group and prolong drastically decision processes.

References

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- [9] Business Process Management Initiative: Business Process Modelling Notation, ver. 1.0, May 2004.
- [10] Workflow Management Coalition: Workflow Process Definition Interface - XML Process Definition Language, WfMC TC 1025, version 1.0, Oct 2002.
- [11] Workflow Management Coalition: Wf XML Binding, WfMC-TC-1023, version 1.1, Nov 2001.

³ This is an initial proposal that comes from our experience. It will be verified practically during the first period of working of this NWG.