

# EUROPEAN MIDDLEWARE INITIATIVE

## PROJECT QUALITY ASSURANCE AND PROGRESS MONITORING PLAN

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**Abstract:**

This deliverable describes the project internal quality assurance plan and all procedures and mechanisms to take and enforce decisions, monitor the status and progress of the project and react to conflicts and risks. This doesn't include the Quality Assurance process for the software development activities of the project, which are specifically defined and monitored by the SA2 Work Package.

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### Delivery Slip

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### Document Change Record

Issue	Item	Reason for Change
1.0	Release	
1.1	Deliverable reviewers selection process	The proposed process was not clear on how to select the reviewers for each deliverables. The process has been clarified
1.2	Updated deliverable process	A new TWiki topic per each review must be created as a subtopic of the deliverable page. The comments to be tracked can be listed using the table in the template OR using the change tracking features of MS Word and attaching the document to the page

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EUROPEAN MIDDLEWARE INITIATIVE

## PROJECT QUALITY ASSURANCE AND PROGRESS MONITORING PLAN

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## 1. INTRODUCTION

### 1.1. PURPOSE

The Quality Assurance and Progress Monitoring Plan for the EMI project defines the quality procedures and measures that shall apply throughout the project for all Work Packages (WPs) of the project.

The EMI Quality Assurance and Progress Monitoring Plan's purpose is to:

- Describe the structure of the organisation responsible for Quality Assurance within EMI
- Present the project's main procedures, standards and tools and describe how compliance with these standards and guidelines will be determined
- Initiate the EMI measurement plan describing the main project metrics that will be reported for EMI
- Present the plan for formal review and QA audits
- List any tools, techniques, and methodologies that will be used when performing Quality Assurance activities

The QA Plan applies to the area of project management and project performance measurement. It does not contain the specific Quality Assurance Plan for the Software Engineering activities of EMI, which is the subject of a separate deliverable (DSA2.1).

### 1.2. DOCUMENT ORGANISATION

This document is organized as follows:

**Chapter 1 INTRODUCTION:** This chapter, explaining the purpose, scope and organization of the document

**Chapter 2 EXECUTIVE SUMMARY:** This chapter contains a high-level description of the document. It gives a summary of the most important points described in each main section.

**Chapter 3 PROJECT QUALITY ASSURANCE ORGANISATION:** This chapter describes how the EMI Project QA is organised, what are the roles and responsibilities of each person or body involved in the QA management.

**Chapter 4 PROJECT OVERALL PROCEDURES, PLANS, STANDARDS AND GUIDELINES:** This chapter describes the project overall management procedures, plans and standards and describes how compliance with them will be determined within each workpackage (i.e. walkthrough, reviews, checklists, automated verifications, etc.).

**Chapter 5 METRICS AND MEASUREMENTS:** This chapter describes the Key Performance Indicators and metrics used within the EMI project work packages to monitor their progress and "measure of success" and assess the degree of achievement of the stated objectives.

**Chapter 6 FORMAL REVIEW AND AUDIT PLAN:** This chapter contains the Project Review and Audit Plan. It describes the procedures used to review deliverables and milestones, prepare the yearly reviews and audit the project progress according to its stated program of work.

**Chapter 7 QUALITY RECORDS:** This chapter describes the main quality records that will be maintained during the project. These records will be stored during the whole project and will be archived five years after the end of the project. They include meeting minutes, deliverables, reports, papers, presentations and any other artefact produced by the project that can be used to assess its progress against the defined objectives.

**Chapter 8 TOOLS, TECHNIQUES, AND METHODOLOGIES:** This chapter describes the main tools and methods used in EMI in support of the management procedures described in the previous sections. It includes a description of the Project Management tools, the document handling tools and any required collaboration, sharing and publishing tool.

**Chapter 9 CONCLUSIONS:** A brief description of the outcome, consequences or further work to be done beyond the work described in the document.

### 1.3. REFERENCES

<b>R1</b>	Hoyle, D. – ISO 9000 Quality Systems Handbook – Butterworth-Heinemann, Oxford, 2002
<b>R2</b>	EGEE III Quality Plan and Measurement Plan (DNA1.2) <a href="https://edms.cern.ch/file/934065/3/EGEE-III-DNA1.2-934065-QAplan-v0_5.pdf">https://edms.cern.ch/file/934065/3/EGEE-III-DNA1.2-934065-QAplan-v0_5.pdf</a>
<b>R3</b>	EMI Description of Work <a href="https://twiki.cern.ch/twiki/pub/EMI/EmiDocuments/EMI-Part_B_20100624-PUBLIC.pdf">https://twiki.cern.ch/twiki/pub/EMI/EmiDocuments/EMI-Part_B_20100624-PUBLIC.pdf</a>

### 1.4. DOCUMENT AMENDMENT PROCEDURE

This document can be amended by the NA1 WP Leader or Deputy Leader further to any feedback from other teams or people. Minor changes, such as spelling corrections, content formatting or minor text reorganisation not affecting the content and meaning of the document can be applied by the NA1 WP Leader or Deputy Leader without peer review. Other changes must be submitted to peer review and to the EMI PEB for approval.

When the document is modified for any reason, its version number shall be incremented accordingly. The document version number shall follow the standard EMI conventions for document versioning. The document shall be maintained in the CERN CDS repository and be made accessible through the OpenAIRE portal.

### 1.5. TERMINOLOGY

<b>CB</b>	Collaboration Board
<b>CDS</b>	CERN Document Server
<b>EC</b>	European Commission



EUROPEAN MIDDLEWARE INITIATIVE

<b>EGEE</b>	Enabling Grids for E-sciencE
<b>FTE</b>	Full Time Equivalent
<b>KPI</b>	Key Performance Indicator
<b>OA</b>	Open Access
<b>OpenAIRE</b>	An Open Access compliant document portal
<b>PD</b>	Project Director
<b>PEB</b>	Project Executive Board
<b>PO</b>	Project Office
<b>PPR</b>	Project Progress Report
<b>PPT</b>	The Project Progress Tracking tool
<b>PR</b>	Periodic Report
<b>PTB</b>	Project Technical Board
<b>QA</b>	Quality Assurance
<b>QAM</b>	Quality Assurance Manager
<b>QAMT</b>	Quality Assurance Management Team
<b>QAP</b>	Quality Assurance Plan
<b>QAR</b>	Quality Assurance Representative
<b>QI</b>	Quality Indicator
<b>QoS</b>	Quality of Service
<b>QR</b>	Quarterly Report
<b>TD</b>	Technical Director
<b>WP</b>	Work Package



## 2. EXECUTIVE SUMMARY

The Quality Assurance and Progress Monitoring Plan for EMI defines the project quality activities such as the evaluation of the adherence to the project's standards, processes, and procedures and the specific QA measures related to each Workpackage within the project. The Plan ensures that standards and procedures are established and followed throughout the project's life cycle. It defines the quality metrics by which the achievements accomplished and services provided by EMI can be evaluated. The Quality Assurance verification activity consists of the regular monitoring of the application of the standards through actions such as verification of documents, participation in reviews and audits, follow-up of corrective actions and analysis of quality indicators.

The EMI Quality Assurance organisation has been designed to suit the widely distributed nature of the project. It is composed of a Quality Assurance Manager (QAM) role and a Quality Assurance Management Team (QAMT) role. The QAMT, led by the QAM, is responsible for the overall coordination of Quality Assurance within EMI. The QAMT is composed of representatives of each Workpackage.

EMI aims to provide production-quality distributed computing middleware services for use in the European and international distributed computing infrastructures like EGI and PRACE and their growing communities of scientific researchers. It is therefore appropriate to evaluate EMI's success in terms of indicators such as:

- Services provided and their utilisation
- Tools and procedures provided within and outside the project
- Project progress, effort and cost
- International recognition

The detailed specifications of the main project indicators are described in the Metrics and Measurement section (§4.2.2).

Quality Assurance is an iterative process [R1] and the Quality Assurance and Progress Monitoring Plan will evolve accordingly. The focus will be on the refinement of procedures, means for verifications and implementation of the main indicators. Success criteria will be measured against relevant indicators, which will be defined according to the users' needs and external projects requirements.

The adopted techniques and strategies are based on industry standard guidelines, but have been adapted using the experience of large, successful distributed projects like EGEE<sup>1</sup> [R2].

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<sup>1</sup> <http://www.eu-egee.org/>

### 3. PROJECT QUALITY ASSURANCE ORGANISATION

#### 3.1. ORGANISATION

The EMI Quality Assurance activity has been organised to take into account the widely distributed aspect of the project and is composed of:

- **A Quality Assurance Manager (QAM):** The QAM role is to define and propose policies for the Quality Assurance of the project and together with the Quality Assurance Management Team coordinate the overall Quality Assurance for the project; to encourage and verify that standards, procedures and metrics are defined at the project level; to make sure they are applied; to report on and propose performance indicators.
- **A Quality Assurance Management Team (QAMT):** The QAMT is composed of representatives of each EMI Workpackage and the Project Technical Board and led by the EMI Quality Assurance Manager. The role of the QAMT is to assist the QAM in coordinating the overall Quality Assurance for the project; to encourage and verify that standards, procedures and metrics are defined within the relevant Work Packages; to make sure they are applied; to evaluate metrics relevant to their Work Packages; to report on and propose performance indicators. The Quality Assurance Management Team members reports to the QAM.

The EMI project foresees a top-level executive body called the Project Executive Board (PEB). The PEB is led by the Project Director (PD) and composed of the Work Package leaders and the Project Technical Director (TD). Given its role and composition, the PEB is a perfect match for assuming the role of QAMT with the PD assuming the role of QAM. This role assignment will be periodically revised and the need for a separate QAMT reporting to the PEB will be evaluated based on the results achieved.

The Quality Assurance Management Team is therefore currently composed of the following members:

Name	Role and WP Representation
Alberto Di Meglio (CERN)	QAM and NA1 representative
Florida Estrella Cainglet (CERN)	Deputy QAM
Balazs Konya (LU)	PTB representative
Diana Cresti (INFN)	NA2 representative
Francesco Giacomini (INFN)	SA1 representative
Alberto Aimar (CERN)	SA2 representative
Morris Riedel (JUELICH)	JRA1 representative

**Table 1: QAMT Composition**

#### 4. PROJECT OVERALL PROCEDURES, PLANS, STANDARDS AND GUIDELINES

This section refers to the project overall main procedures, plans, standards and tools and describes how compliance with them will be determined within each workpackage (i.e. walkthrough, reviews, checklists, automated verifications, etc.).

The procedures are categorized in Project Management, Document Management, Configuration Management and Quality Record Keeping and organized as described in the following Table 2, Table 3, Table 4 and Table 5.

<b>Project Management</b>			
<b>Project overall Procedures, Plans, Guides</b>	<b>QA Task</b>	<b>Validation methods</b>	<b>Checking Responsibility</b>
<b>Project members registration</b>	Cross checking with timesheets, data validity assessments	Manual	NA1
<b>Project planning and reporting</b>	PNET data assessment	Manual	PD, NA1, PEB
	Timesheet checks	Manual Automated notifications from PNET and PPT	WP Leaders
	Timesheet random checks	Manual	NA1, PEB
	Internal Cost Claim	Manual	Partners, NA1
	EU Cost Claim	Manual	Partners, NA1
	EU Quarterly and Periodic reports	Manual Automated notifications from PNET and PPT Project Dashboards in PNET and PPT	WP Leaders, PD
	EU review	Manual	PD, WP Leaders, partners
<b>Work Packages' Activity Plans</b>	Periodical updates All Hands Meeting review	Manual	WPL, PEB
<b>Risk Management</b>	Risk assessment and contingency plans	Manual	WPL, PM, PMB

**Table 2: Project Management Procedures**

<b>Document management</b>			
<b>Project overall Procedures, Plans, Guides</b>	<b>QA Task</b>	<b>Validation methods</b>	<b>Checking Responsibility</b>
<b>EC deliverables review procedure</b>	Internal WP review, formal EMI and external reviews, PEB approval	Manual	QAMT, PEB, WPs
<b>EC milestones reporting procedure</b>	Internal WP review, PEB approval	Manual	QAMT, PEB, WPs
<b>EC quarterly and periodic report procedure</b>	PEB review, CB approval	Manual	QAMT, CB, PEB, WPs
<b>Document storage and accessibility</b>	Periodical checks	Manual	QAMT
<b>Publication procedure (papers, conferences, etc.)</b>	Internal WP and PTB reviews, formal PEB review on NA2 proposal	Manual	QAMT, PEB, PTB, WPs

**Table 3: Document Management Procedures**

<b>Configuration Management</b>			
<b>Project overall Procedures, Plans, Guides</b>	<b>QA Task</b>	<b>Validation methods</b>	<b>Checking Responsibility</b>
<b>Configuration Management</b>	Configuration management, monitoring, reporting of documents and other project artifacts	Manual Automatically generated reports from CDS	WPL

**Table 4: Configuration Management Procedures**

<b>Quality Records Keeping</b>			
<b>Project overall Procedures, Plans, Guides</b>	<b>QA Task</b>	<b>Validation methods</b>	<b>Checking Responsibility</b>
<b>Quality Records</b>	Monthly review	Manual	QAMT

**Table 5: Quality Records Keeping Procedures**

#### 4.1. PROJECT MANAGEMENT

The project management procedures concern the management and reporting of aspects like user registration, tasks allocation, effort consumption, costs, risk assessment, etc.

#### 4.1.1 Project members registration

Several CERN tools are used in EMI, like for example:

- Twiki for project internal webpages
- PPT for effort reporting
- CVS, SVN and Savannah for source code version management
- Indico for event management
- CDS with the OpenAIRE front-end for the public document server

CERN therefore provides all project members with an EMI-specific CERN account. The procedure for project members requiring access to these tools is as follows:

1. Project member or beneficiary supervisor sends request to [emi-po@cern.ch](mailto:emi-po@cern.ch). All requests must be accompanied by a scanned copy of the project member's national identity card or passport.
2. For project members who have not been registered at CERN before, the EMI Project Office will register the member as an 'external' member of CERN in the human resource database.
3. For all project members, newly registered or not, a new 'EMI association' is added by the EMI Project Office to their human resource record.
4. For all project members, CERN computing accounts are either created (for newly registered members) or re-activated (for dormant accounts). These accounts do not give right to be assigned a standard CERN x509 certificate. Users will have to get a valid and recognised certificate from their own Institute.

#### 4.1.2 Project planning and reporting

The Project planning and reporting procedure consists in the establishment of a global project work plan based on the Work Breakdown Structure (WBS) described in the EMI Description of Work (DoW) [R3].

At the beginning of the project, the PD creates a project baseline containing a list of all high-level tasks and assigns effort to each task according to the plan. The effort is then tracked on a monthly basis using data from the effort reporting tools. Any significant deviation from the estimates is discussed at the PEB. If modifications to the plan are required, a new baseline is created and effort allocation modified accordingly. The plan and the baselines are managed using a project management tool called Project.NET, which is described in more details in chapter 8.

The actual effort and budget consumption are calculated every month by the EMI Project Office (part of the NA1 Work Package) based on data reported by the project members and by the partners' administrative personnel (timesheets and internal cost claims). The actual values and the time trends are then compared to the expected consumption rates. A flat consumption rate of effort and money is assumed throughout the project. Any significant deviation in effort consumption is discussed at the PEB in order to assess the situation and prepare recommendations for the EMI Collaboration Board. Any significant deviation in budget consumption is reported to the CB for further discussion. Effort and costs are monitored using a tool called PPT (Project Tracking Tool), which is described in more details in chapter 8.

The project planning, effort and cost data are consolidated on a quarterly basis by the EMI PO and reported to the European Commission on the Quarterly Reports. Once per year in occasion of the yearly periodic review, the data is consolidated on a yearly basis and reported in detailed to the EC in the Periodic Management Reports and presented at the Periodic Reviews.

### 4.1.3 Work Packages' Activity Plans

The EMI Work Packages are expected to prepare and maintained an Activity Plan. The Work Package leaders are the owners of the respective WP Activity Plan. The Work Package leaders are free to choose the format of their activity plan, as long as it fulfils the following criteria:

- 1) It's publicly accessible
- 2) It's measurable

In most cases the activity plans are contained in one or more of the planned deliverables, like the NA2 Exploitation and Sustainability Plan, the SA1 Software Maintenance and Support Plan, the SA2 Quality Assurance Plan and the JRA1 Technical Areas Work Plan and Status Reports.

Specific work items from the WP activity plans are fed into the overall project work plan and make part of the project baselines with their associated milestones.

The activity plans are periodically revised either informally during the periodic PEB meetings or formally with new official revisions of the corresponding deliverables. Any significant deviation is discussed at the PEB or PTB, which have the task to collectively find appropriate administrative or technical solutions. In case no acceptable solution can be found, the PD can escalate the issues to the CB for further discussion.

### 4.1.4 Risk Management

The PD and each Workpackage Leader are expected to maintain a Risk List with a description of the identified activity and overall project risks. This list of risks and any suitable contingency and corrective action is reported monthly at the PEB meetings, quarterly in the Quarterly Reports and reviewed at each "All Hands Meeting". Contingency actions are discussed at the PEB and implemented based on documented decisions. Any issue that cannot be successfully handled by the PEB can be escalated by the PD to the CB for further discussion.

## 4.2. DOCUMENT MANAGEMENT

The document management procedures concern the management and reporting of aspects like deliverables production and review, documents storage and access, scientific publications productions, etc.

### 4.2.1 EC Deliverables Review Procedure

All EC Deliverables have to go through the agreed internal review procedure before being submitted to the EC. The procedure is described below and also on the EMI TWiki site at:

<https://twiki.cern.ch/twiki/bin/view/EMI/EmiDeliverableProcedure>





1. Deliverable authors must use the deliverable template either in DOC or ODT format. Other formats are not supported. A PDF file can be provided in addition for convenience.
2. **30 days before submission date:** Authors send the ToC to task leader and WP leader for formal validation. The WP leaders sends it to the PEB for validation and to the EMI PO ([emi-po@cern.ch](mailto:emi-po@cern.ch)) for tracking. The EMI PO forwards it to the reviewers. If the authors are themselves task leaders or WP leaders, of course the document is only sent as appropriate
3. **20 days before submission date (or 10 days after the previous step):** Authors send **complete and high quality** deliverable to the task leader and WP leader for formal validation and to the EMI PO. The EMI PO forwards it to the PEB and the reviewers. Reviewers can reject documents with missing or incomplete sections, bad formatting, and excessive grammatical and spelling errors.
4. **15 days before submission date (or 5 days after the previous step):** PEB and reviewers send comments to authors using twiki-based review form (<https://twiki.cern.ch/twiki/bin/view/EMI/EmiDeliverableReviewTemplate>). The form contains various fields to be filled by the reviewers and the authors. In particular the detailed comments table allows them to interactively discuss about specific topics and record questions and answers. It is suggested to subscribe to the twiki topic modification notifications to get automatic alerts. A new TWiki topic per each review must be created as a subtopic of the deliverable page. The comments to be tracked can be listed using the table in the template OR using the change tracking features of MS Word and attaching the document to the page.
5. **10 days before submission date (or 5 days after the previous step):** Authors send revised version to PEB and reviewers
6. **5 days before submission date (or 5 days after the previous step):** PEB sends notification of final acceptance or motivated rejection to the authors
7. Approved deliverables are converted to PDF by the EMI Project Office and published in the document repository, currently hosted on the EMI TWiki site at <https://twiki.cern.ch/twiki/bin/view/EMI/EmiDeliverables> (The official CDS/OpenAIRE repository is still to be launched at the time of this writing).
8. If deliverable is rejected by the PEB, a new iteration starts. The EMI Project Office notifies the EC of the delay

#### Notes on reviewer selection:

1. The Work Package leader is responsible to coordinate the process of selecting appropriate reviewers for the deliverables. The WP leader must contact other WP leaders within EMI or knowledgeable persons outside EMI and ask for the names of possible reviewers. The WP leader is requested to make sure that reviewers are selected for each deliverable at least three months before the deliverable due date.
2. Workpackage leaders are responsible for looking for appropriate deliverable reviewers external to their activities at least three months before the submission date. The reviewers have to be chosen taking into account the skills and technical knowledge required to understand and critically assess the document within the context of EMI. Possibly they should be chosen from a different WP than the one issuing the deliverable, with the exception of JRA1 where the extent and diversity of skills may allow for independent reviews within the same WP. Whenever appropriate or necessary, external reviewers should also be considered, especially when the deliverable concerns topics of relevance in the relationships of EMI with other projects or communities.

## 4.2.2 EC Milestone Reporting Procedure

The milestone report is a formal document stating that a milestone has been achieved. The report provides a concise description of how the milestone was met. The milestone report is not a technical document and should not contain long technical descriptions or specifications. If necessary, the latter should be referenced in the report.

The Milestone review procedure is as follows:

1. Milestone report authors must use the milestone report template either in DOC or ODT format. Other formats are not supported. A PDF file can be provided in addition for convenience. The template can be found at [https://twiki.cern.ch/twiki/pub/EMI/EmiTemplates/EMI\\_MSn\\_template\\_v2.1.doc](https://twiki.cern.ch/twiki/pub/EMI/EmiTemplates/EMI_MSn_template_v2.1.doc)
2. Milestone report authors must send the document to the workpackage leader within which the milestone was achieved. The DoW indicates the milestone due dates, and authors must send the report for review no later than M+10 days, where M is the last day of the due date month. The workpackage leader will verify the content and format of the document and send it to the PEB for the final approval or rejected for modifications.
3. PEB sends notification of final acceptance or motivated rejection to the authors within 1 week of the reception of the milestone from the workpackage leader.
4. Approved milestone reports are converted to PDF by the EMI Project Office and published in the document repository, currently hosted on the EMI TWiki site at <https://twiki.cern.ch/twiki/bin/view/EMI/EmiMilestones> (The official CDS/OpenAIRE repository is still to be launched at the time of this writing).

If a milestone is not achieved within the expected deadline, the PD must foresee appropriate time for discussion during the regular PEB meeting to identify the issue and define appropriate corrective actions. Changes of plan can also be considered in case the milestone is not relevant anymore due to changed technical conditions. In case a relevant milestone is not achieved even after reasonable corrective actions have been defined and proposed, the PD must escalate the issue to the CB and discuss possible interventions on the Partner(s) responsible for the milestone.

## 4.2.3 EC Quarterly and Periodic Reports Procedure

The Quarterly Reports (QR) and Periodic Reports (PR) are official contractual obligations the project has to fulfil towards the European Commission. The QRs and PRs include the project achievements, attainment of milestones and deliverables, issues and differences between work expected to be carried out in accordance with DoW and that actually carried out.

The QRs are produced three times per year, while the fourth quarter is covered by the PR, which presents a general assessment of the full 12-month reporting period. The PR follows a standard template provided by the EC, while the QR follows an EMI template. Both templates can be found on the EMI Templates page in TWiki (<https://twiki.cern.ch/twiki/bin/view/EMI/EmiTemplates>).

The process to submit contributions for the QR is as follows:



1. Each WP leader provides his/her contribution within 10 days after the end of the quarter using the template at [https://twiki.cern.ch/twiki/pub/EMI/EmiTemplates/EMI-WPXX-QRX\\_Template.doc](https://twiki.cern.ch/twiki/pub/EMI/EmiTemplates/EMI-WPXX-QRX_Template.doc). The contribution must be uploaded to the QR page in TWiki at <https://twiki.cern.ch/twiki/bin/view/EMI/EmiQRs>. The page is restricted to PEB members only.
2. Project administrators provide estimated costs within 10 days after the end of the quarter using the quarterly costs template. *Exceptionally, the WP leaders and project administrators' contributions to the first quarter reports of each reporting period (Q1, Q5 and Q9) must be provided on 15th of July to take into account the holiday season.*
3. The EMI Project Office produces the consolidated report within 20 days after the end of the quarter and sends it to the PEB and the CB for verification and comments
4. The EMI PO sends the final QR is sent to the EC within 30 days after the end of the quarter

EMI Quarters	Months covered
Q1	May10-Jul10
Q2	Aug10-Oct10
Q3	Nov10-Jan11
Q4	Feb11-Apr11
Q5	May11-Jul11
Q6	Aug11-Oct11
Q7	Nov11-Jan12
Q8	Feb12-Apr12
Q9	May12-Jul12
Q10	Aug12-Oct12
Q11	Nov12-Jan13
Q12	Feb13-Apr13

**Table 6: Quarterly reporting periods**

The process to submit contributions for the PR is as follows:

1. WP leaders provides contributions 20 days before the end of the period using the same template as the QR
2. Partner administrators report estimated costs for the final quarter within 20 days from the end of the period. Partner administrators provide official cost claims within 45 days from the end of the period
3. The EMI PO produces the consolidated PR, including effort accounting from PPT, by the end of the period and sends it to the PEB and the CB for verification and comments

4. The EMI PO sends the final PR to the EC 10 working days before the Review and at the latest within 60 days after the end of the period. If the final report is not yet available for the EC review, the EMI PO can send a preliminary PR informing the EC. *Note: The review takes usually place within 45 days from the end of the reporting period*

EMI Reporting Periods	Months covered
P1	May10-Apr11
P2	May11-Apr12
P3	May12-Apr13

**Table 7: Periodic reporting periods**

#### 4.2.4 Document storage and accessibility

All EMI public documents need to be stored in a publicly accessible document storage system compliant with the Open Access policy as recommended by the European Commission. The NA1 Work Package is responsible to set up and administer an OA-compliant repository by making use of one of the existing OA-compliant document management systems. It has been decided to make use of the services provided by the OpenAIRE<sup>2</sup> project and to store the EMI documents in the CERN Document Server (CDS), which is one of the institutional repository connected with the OpenAIRE system. A specific EMI storage area is being set up in CDS, which will also allow the project members to manage the process of reviewing deliverables and other documents. In this case the review procedures will be updated accordingly.

#### 4.2.5 Publication procedure (papers, conferences, etc.)

Publication of EMI ‘project foreground’ (results, achievements, discoveries) must be communicated to the PEB, so that it can assess its compliance with the quality standards and allow NA2 to collect metrics on dissemination.

The PEB can veto the publication of material in breach of the GA or CA. In particular the following criteria have to be fulfilled:

- All contributors have to be informed that some of their work is being used in the publication and provide their consent
- If previously unpublished material is used from parties other than the proposing authors, written consent must be obtained
- All contributors must be acknowledged either as (co)authors or in the publications acknowledgment section

In particular papers submitted to peer-reviewed journals and describing work done within the EMI project have to be submitted to the PEB to get formal approval before they are submitted to the journal in their final form.

<sup>2</sup> <http://www.openaire.eu/>

All published material must be released under Open Access and a copy stored in the EMI Document Repository (CDS/OpenAIRE). In the case of papers published by scientific journals, every effort must be made by the authors to preserve the Open Access rights.

Finally, all publications must acknowledge the EC funding contribution under contract INFISO-RI-261611 as stated in the EMI project Grant Agreement – Part B (Description of Work) [R3]. The exact wording to include depends on the type of document as shown in

Document type	Wording	Location
Paper, Journal article, etc	“EMI is partially funded by the European Commission under Grant Agreement INFISO-RI-261611”	Usually, in the final Acknowledgment section
Presentation	“EMI is partially funded by the European Commission under Grant Agreement INFISO-RI-261611”	Usually, on the last slide under the EMI logo (use template)
	“EMI - INFISO-RI-261611”	In the footer or sidebar of each slide

The official EMI Presentation template can be found on the EMI TWiki Templates page at:

<https://twiki.cern.ch/twiki/pub/EMI/EmiTemplates>

### 4.3. CONFIGURATION MANAGEMENT

Configuration management in the scope of this Quality Assurance plan refers to all artefacts produced by the project during its execution with the exclusion of software and related documentation, which is in the scope of deliverable DSA2.1 (Quality Assurance Plan).

All artefacts produced by the project have to be versioned and stored in the appropriate archival systems. In particular, this applies to contractually relevant documents, such as deliverables, milestones and periodic reports.

The EMI project defines the following types of document templates:

- The Deliverable  
([https://twiki.cern.ch/twiki/pub/EMI/EmiTemplates/EMI-DXXX-REFNUMBER-TITLE-vX\\_Y.doc](https://twiki.cern.ch/twiki/pub/EMI/EmiTemplates/EMI-DXXX-REFNUMBER-TITLE-vX_Y.doc))
- The Milestone Report  
([https://twiki.cern.ch/twiki/pub/EMI/EmiTemplates/EMI\\_MSn\\_template.doc](https://twiki.cern.ch/twiki/pub/EMI/EmiTemplates/EMI_MSn_template.doc))
- The External Trip Report  
(<https://twiki.cern.ch/twiki/pub/EMI/EmiTemplates/EMI-External-Trip-Form.doc>)
- The Presentation  
([https://twiki.cern.ch/twiki/pub/EMI/EmiTemplates/EMI\\_Template\\_v0\\_1.ppt](https://twiki.cern.ch/twiki/pub/EMI/EmiTemplates/EMI_Template_v0_1.ppt))

In addition, EMI adopts the recommended templates for Quarterly and Periodic Reports as described in the FP7 Reporting Guidelines.

All templates provide specific fields for the at least following items:

- Title
- Authors
- Date
- Version

The version of the documents must be increased at every revision and successive versions must be stored in the EMI CDS repository. Access to the documents depends on their sensitivity. Deliverables marked as PRIVATE and quarterly or periodic reports are not PUBLIC and they are protected by an active authentication and authorization system in the document server.

The version of the document must be increased according to the following rules:

1. The version number is composed of three (3) numbers and has the format x.y.z. The three numbers are called major version (x), minor version (y) and revision number (z) respectively. If z=0, it can be omitted.
2. Modifications to fix spelling mistakes or change the wording of sentences to clarify their meaning require a change in the revision number (z)
3. Modifications to extend the existing content without substantially modifying the original scope, applicability or purpose of the document require a change in the minor version (y)
4. Modifications to change the content modifying the original scope, applicability or purpose of the document require a change in the major version (x)

All documents will be stored in the document servers for at least 5 years after the end of the EMI project.

#### **4.4. QUALITY RECORDS KEEPING**

The Quality Record Keeping procedures concern all actions necessary to store evidence of correct execution of the other project procedures in support of the continuous assessment of the project compliance with the QA plan. The defined quality records and their management are described in detail in section 7.

## 5. METRICS AND MEASUREMENTS

This section describes the Key Performance Indicators and metrics used within the EMI project work packages to monitor their progress and “measure of success” and assess the degree of achievement of the stated objectives. EMI aims to provide production-quality distributed computing middleware services for use in the European and international distributed computing infrastructures like EGI and PRACE and their growing communities of scientific researchers. It is therefore appropriate to evaluate EMI’s success in terms of indicators such as:

- Services provided and their utilisation
- Tools and procedures provided within and outside the project
- Project progress, effort and cost
- International recognition

### 5.1. KEY PERFORMANCE INDICATORS

Each activity in EMI has an associated set of Key Performance Indicator compliant with ITIL or COBIT when relevant. The KPIs are used throughout the project to monitor the performance of the Work Packages and detect as early as possible weaknesses and define corrective actions. The measured values of the KPIs will be reported quarterly to the EC as part of the quarterly and periodic reports.

The following table contains the full list of the KPIs defined for each Work Package.

Code	WP	KPI	Description	Method to Measure	Estimated Targets
<b>KNA1.1</b>	<b>NA1</b>	Cost efficiency	A measure of the cost of providing software maintenance and support services in EMI	Unit cost of effort for kSLOC of change or addition to the software base	Should decrease compared to the initial baseline of running ARC, gLite and UNICORE as separate projects
<b>KNA1.2</b>	<b>NA1</b>	MoUs with commercial companies	The number of formal collaborations with commercial companies is support to the EMI sustainability and exploitation plans	Periodic reporting	Year 1: 3 Year 2: 3 Year 3: 3
<b>KNA2.1</b>	<b>NA2</b>	Number and quality of events organised	Number of events organized or co-organized by EMI	Follow-up metrics by means of real time online polls and other tools. For example: Did you like our presentation? Was it	2 per year



				easy to understand? What component(s) did you already know? What standard are you interested in? Find your closest EMI associate. Set up an appointment to talk to one of us. Sign up to newsletter.	
<b>KNA2.2</b>	<b>NA2</b>	Number and quality of published material	Journal papers or articles and presentations at relevant conferences produced from EMI research activities	Periodic reports	4 per year
<b>KNA2.3</b>	<b>NA2</b>	Number and quality of training events	Number of training events organized by EMI and number of trained people	Follow-up metrics by means of real time online polls and other tools. For example: Did you like the training course? Was it easy to understand? Is the training material up-to-date/comprehensive?	4 per year
<b>KNA2.4</b>	<b>NA2</b>	Number of EMI products included in standard repositories, Linux distributions, etc	This is the number of EMI packages that become part of standard OS distributions like Fedora or Ubuntu	Periodic reports	80% of the client components, selected services based on requirements
<b>KSA1.1</b>	<b>SA1</b>	Number of incidents	Number and trends of incidents registered by EMI Support (in total and per category)	GGUS report or query	The trend should follow a standard Rayleigh curve
<b>KSA1.2</b>	<b>SA1</b>	Incident Resolution Time	Average time for resolving an incident by the 3rd-level support (possibly per category)	GGUS report or query	Within the SLA specifications
<b>KSA1.3</b>	<b>SA1</b>	Number of Problems	Number and trends of problems	Defect Tracker report or query	The trend should follow a standard



			(defects) submitted in the Defect Tracker(s) (in total and per category) as absolute value and as density over kSLOC		Rayleigh curve
<b>KSA1.4</b>	<b>SA1</b>	Number of Urgent Changes	Number of changes (defects or enhancements) with priority Immediate	Defect Tracker report or query	A precise target cannot be estimated, but too frequent Immediate changes are symptom of poor Quality Control. It is tentatively set at < 1 per month
<b>KSA1.5</b>	<b>SA1</b>	Change Application Time	Average time, from incident submission to release, for applying a change (possibly per category and priority)	Tracker report or query	Within SLA specifications
<b>KSA1.6</b>	<b>SA1</b>	Number of Releases	Number of releases grouped into Major, Minor, Revision and Emergency	Periodic report by the Release Manager	According to Release Plan to be
<b>KSA1.7</b>	<b>SA1</b>	Number of Release Rollbacks	Number of releases which had to be reversed (rolled-back)	Periodic report by the Release Manager	< 4 releases per year
<b>KSA2.1</b>	<b>SA2</b>	Services Reliability	% uptime dependent only on the SA2 services themselves (individual KPIs for test beds, repository, etc)	Participating monitoring tools	sites 99%



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<b>KSA2.2</b>	<b>SA2</b>	Services Availability	Total % uptime including the underlying suppliers (individual KPIs for test beds, repository, etc)	Participating monitoring tools	sites 97%
<b>KSA2.3</b>	<b>SA2</b>	Distributed Testbed Size	Number of CPUs available for distributed testing through collaborations with external providers (NGIs, sites, commercial providers, other projects, etc)	Participating sites monitoring tools	Year 1: 50 CPUs Year 2: 200 CPUs Year 3: 500 CPUs
<b>KSA2.4</b>	<b>SA2</b>	Number of key process assessments	A process assessment is a periodic exercise to evaluate the efficiency of a process and identify weaknesses and areas for improvements	Periodic reports	One per year for the major processes (Release, Change, Problem), results to be reported in the QA report to be submitted at the end of every year).
<b>KSA2.5</b>	<b>SA2</b>	Number of weaknesses detected and addressed: related to the assessment	A measure of how many of the weaknesses identified in the periodic assessments are addressed and their impact on the process efficiency	Periodic reports	One per year for the major processes (Release, Change, Problem), results to be reported in the QA report to be submitted at the end of every year for the preceding year assessment).
<b>KSA2.6</b>	<b>SA2</b>	Number of Support Requests	Number of user request/tickets per quarter (categorized by services or type of request) for the SA2 services (tools and	GGUS report or query, internal support tracker	Within QA Plan and agreed Operational level Agreements with the other WPs





<b>KSA2.7</b>	<b>SA2</b>	Average Support Response Time	testbeds) Average time to respond to a request/ticket: time to the first reply to the user (to see reaction time to the tickets, categorized by tickets types)	GGUS report or query, internal support tracker	Within QA Plan and agreed Operational level Agreements with the other WPs
<b>KSA2.8</b>	<b>SA2</b>	Average Support Request Life Time	Average life time of a request/ticket: time from start to end of a ticket (to see time needed to close the tickets, categorized by tickets types)	GGUS report or query, internal support tracker	Within QA Plan and agreed Operational level Agreements with the other WPs
<b>KJRA1.1</b>	<b>JRA1</b>	Number of Adopted Open Standard Interfaces	This metric provides a measurable indicator whether the EMI product suite continuously adopts (emerging) open standards (e.g. OGSA-BES, JSDL, SAML, etc.) thus achieving an increasing standard-compliance throughout the delivered products. It will thus indicate the adoption rate of the EMI product suite.	In general this metric should have one overall numeric value that increases during the course of the project for each standard of an EMI product. Each standard-based interface per product will be summarized enabling the thorough evaluation of the number of adoption of open standards for the whole EMI project in general and for each product in particular.	Estimated targets will be defined in a matrix notation along with the standardization roadmap and its updates. One example of this metric can be seen in Table 9 below
<b>KJRA1.2</b>	<b>JRA1</b>	Number of Interoperable Interface	This metric provides a measurable indicator whether	In general this metric should have an indicator as one general numeric value	Estimated targets will be defined in a matrix notation



	Usage	<p>the EMI product suite itself can benefit from the adoption of open standards by using interoperable interfaces of products with dedicated other standard-based technologies (e.g. client, library, broker, etc.). It will thus indicate the standard usage within the EMI product suite in general and measure the interoperable interface usage in particular.</p>	<p>that increases during the course of the project. For each of the standard-based interfaces in the EMI product suite each use of this interface should increment the value per technology (e.g. client, library, broker, etc.). This illustrates the number of interoperable interface usage. Over time, it is expected that the number grows with the number of adopted standards. The setup of this KPI will be a matrix that defines the amount of interface usages between the different EMI products. The initial target of the KPI in the matrix will be precisely defined for each relevant open standard interface per used product as part of the 'Standardization Roadmap Document' that is the outcome of the following milestone</p>	<p>along with the standardization roadmap and its updates. One example of this metric can be seen in Table 10 below</p>
<p><b>KJRA1.3 JRA1</b></p>	<p>Number of reduced lines of code</p>	<p>This metric provides a measurable indicator whether the EMI product suite can reduce its overall lines of codes in order to reduce its maintenance efforts. The aim of this measure is twofold. First, it proves that the actual lines of codes that have to be maintained are actually reduced during the course of the project. Second, it indicates code</p>	<p>This metric is generated by the common build and QA system. It is expected that the sum of all SLOCs will be decreasing over the period of the project runtime even when new developments are foreseen that in turn again aim to reduce duplicate functionalities and thus the overall number of SLOCs. The current situation of this KPI in terms of SLOCs per product will be initially defined starting with the beginning of the project and finalized once all</p>	<p>&gt; 33% (1/3) reduction over the three-year activity. The reduction can be consequence of removing components or replacing them with commercial or community alternatives</p>

			re-use and the harmonization of products that includes avoiding duplicate developments where possible when comparing one product to another one with the same functionality (i.e. slightly increasing SLOC vs. significantly reduced SLOCs).	product teams have been defined and their products are available within the build tool.	
<b>KJRA1.4</b>	<b>JRA1</b>	Number of reduced released products	This metric provides a measurable indicator whether the EMI product suite is decreasing the overall maintenance in terms of the amount of supported products while keeping the same functionality or re-use functionality provided by other vendors or technology providers.	This metric is a numeric value that indicates the number of different products within an EMI product release. It is expected that this value is decreasing during the course of the project.	>= 2 products per year in average over three years

**Table 8: EMI Key Performance Indicators**

	OGSA-BES	PGI	JSDL	SAML	#
<b>CREAM-BES</b>	1		1		2
<b>CREAM-PGI</b>		1	1		2

<b>UNICORE-BES</b>	1		1	1	3
<b>A-REX (BES)</b>	1		1		2
<b>SUM</b>	<b>3</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>9</b>

Table 9: Example of Standardization KPI Targets

	ARCLib A	Sec Lib B	Rich Client	WMS	#
<b>CREAM-BES</b>	1		1	1	3
<b>CREAM-PGI</b>	1		1		2
<b>UNICORE-BES</b>	1		1	1	3
<b>A-REX (BES)</b>	1		1	1	3
<b>ARGUS (SAML)</b>		1			1
<b>VOMS (SAML)</b>		1			1
<b>SUM</b>	<b>4</b>	<b>2</b>	<b>4</b>	<b>3</b>	<b>13</b>

Table 10: Example of Interoperable Interface Usage KPI Targets

## 6. FORMAL REVIEW AND AUDIT PLAN

### 6.1. EC DELIVERABLES REVIEW

EMI has a scheduled deliverable plan agreed with the EC as defined in the Project Description of Work [R3]. The complete list of deliverables and their current status can be found at:

<https://twiki.cern.ch/twiki/bin/view/EMI/EmiDeliverables>

The EC deliverable review procedure (internal to the project before being submitted to EC) has been described in section 4.2.1.

### 6.2. EC MILESTONES REVIEW

EMI has a scheduled milestone plan agreed with the EC as defined in the Project Description of Work [R3]. The complete list of milestones and their current status can be found at:

<https://twiki.cern.ch/twiki/bin/view/EMI/EmiMilestones>

The EC milestone review procedure (internal to the project before being submitted to EC) has been described in section 4.2.2.

### 6.3. PROJECT PERIODIC REVIEWS

The aim of a European Commission (EC) technical audit (periodic review) is to assess the work carried out under the project over a certain period and provide recommendations to the Commission. Such review may cover scientific, technological and other aspects relating to the proper execution of the project and its EC grant agreement. For the EMI reviews, the PD and WP leaders must provide presentations outlining the major achievements and challenges of the reporting period. Each review is preceded by at least three rehearsals. EMI will have three technical audits corresponding to the three reporting periods:

EMI Reporting Periods	Months covered
Period 1 (P1)	May 2010 - Apr 2011
Period 2 (P2)	May 2011 - Apr 2012
Period 3 (P3)	May 2012 - Apr 2013

**Table 11: Periodic reporting periods**

The procedure for organizing the periodic review is as follows:

1. The EMI Project Office (PO) agrees with the EC project officer on the review date and location as early as possible, but no later than two months before the end of the reporting

period. The EMI PO communicates to the PEB and CB the review logistics and names of reviewers

2. The PEB agrees on the organisation of the review rehearsals (time, place, type, e.g. face to face or virtual meeting) at least two months before the end of the reporting period
3. The first review rehearsal, face to face or virtual meeting, must take place about a month before the review. Drafts of all presentations must be available to the PEB at least five working days before the first review rehearsal.
4. The second review rehearsal is face to face and must take place within 10 to 15 days before the review. Updated presentations should have taken into account comments from the first rehearsal.
5. The final 'dress' rehearsal is face to face and should take place within one or two days before the review.

See also Guidance notes and templates for Project Technical Review involving Independent Expert(s)<sup>3</sup>

#### **6.4. ADDITIONAL REVIEW WITHIN THE WORKPACKAGES**

Additional review activities within each workpackage are implemented by each Workpackage Leader as necessary and monitored by the QAMT. The need and format of the review is established by the PEB based on the values of the KPIs and the performance in preparing deliverables and milestones.

#### **6.5. INTERNAL AUDITS**

Specific audits on strategic activities or procedures can be requested by the QAM with the agreement of the PEB. Each workpackage can decide to organise dedicated internal audits, even using informal procedures. For audits, the schedule, resources, methods and procedures to be used will be specified one month before the audit.

#### **6.6. QA PLAN CONTINUAL IMPROVEMENT PROCESS**

The present Quality Assurance Plan is itself subjected to periodic revisions and modifications to make sure its information is kept relevant and up-to-date. The described procedures, methodologies and tools undergo periodic assessments based on the described performance indicators and can change during the lifetime of the EMI project as necessary. Every time a change is introduced, the Plan will be updated accordingly and a new revision will be published.

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<sup>3</sup> [ftp://ftp.cordis.europa.eu/pub/fp7/docs/project\\_review\\_en.pdf](ftp://ftp.cordis.europa.eu/pub/fp7/docs/project_review_en.pdf)

## 7. QUALITY RECORDS

This section describes the main quality records that will be maintained during the project. These records will be stored during the whole project and will be archived five years after the end of the project. They include meeting minutes, deliverables, reports, papers, presentations and any other artefact produced by the project that can be used to assess its progress against the defined objectives.

Meeting minutes	Attached to the EMI agenda pages in the Indico system: <a href="http://indico.cern.ch/categoryDisplay.py?categId=2560">http://indico.cern.ch/categoryDisplay.py?categId=2560</a>
Deliverables and Milestones	The documents are stored in the Deliverables collection of the EMI project in the CDS system.  The complete list of deliverables and their current status is maintained at:  <a href="https://twiki.cern.ch/twiki/bin/view/EMI/EmiDeliverables">https://twiki.cern.ch/twiki/bin/view/EMI/EmiDeliverables</a>
Deliverables review dialog forms	The forms are provided in the EMI TWiki in the dedicated page of each deliverable.
EU Quarterly and Periodical Report	In the Management collection of the EMI NA1 WP in the EMI CDS system and in TWiki at:  <a href="https://twiki.cern.ch/twiki/bin/view/EMI/EmiQRs">https://twiki.cern.ch/twiki/bin/view/EMI/EmiQRs</a>
EU review report	In the Management collection of the EMI NA1 WP in the EMI CDS system:
ETICS Metrics Measurements	In the KPIs topic of the EMI TWiki site:  <a href="https://twiki.cern.ch/twiki/bin/view/EMI/EmiKPIs">https://twiki.cern.ch/twiki/bin/view/EMI/EmiKPIs</a>
Risk management file	Management collection of the each WP within CDS
Other Quality records: Checklist, etc.	Management folder of the each WP within CDS Relevant EMI TWiki pages and links

## 8. TOOLS, TECHNIQUES, AND METHODOLOGIES

This section describes the main tools and methods used in EMI in support of the management procedures described in the previous sections. It includes a description of the Project Management tools, the document handling tools and any required collaboration, sharing and publishing tool.

### 8.1. DOCUMENT PREPARATION TOOLS

The following tools are recommended for EMI official documents:

- Word processing: MS Word or OpenOffice Word Processor (or compatible programs supporting the DOC or ODT formats)
- Spreadsheet: MS Excel or OpenOffice (or compatible programs supporting the XLS or ODS formats)
- Slides presentation: MS PowerPoint and OpenOffice Presentation (or compatible programs supporting the PPT or ODP formats).
- Document Management tools: CDS and OpenAIRE (as an front-end for CDS)

Documents in their final status can be converted to other suitable format (like PDF), but it is recommended not to only use the above formats to edit and share documents for review. All official documents to be submitted the EC must be available in PDF format.

### 8.2. PROJECT PROGRESS TRACKING

Project Management activities are implemented using a tool called Project.NET. A dedicated installation of the program is available at CERN and it has been customized for EMI. The program contains the EMI project WBS and is mainly used by the PD and the PEB members to track baselines and tasks. Individual EMI members can also use the tool to enter task updates or just to be updated on the current project status. The tool requires username and password and does not provide any world readable access. Instructions on how to use the Project.NET tool are available at [http://doc.project.net/Main\\_Page](http://doc.project.net/Main_Page).

The official EMI instance can be found at:

<https://emiproject.cern.cn>

### 8.3. EFFORT TRACKING

Effort tracking is done using the CERN PPT tool (Project Tracking Tool), which has been designed and developed by CERN exactly to manage effort tracking of large distributed projects and complies with the EC FP7 requirements. The tool is used by NA1 to track and report on the effort consumption during the project execution as required by the EC. Individual partners can have internal timesheet system for official auditing purposes. However, they are still required to provide information in the PPT tool to allow the PD to monitor the overall project effort and create consolidated reports. Instructions on how to use PPT for EMI can be found at <https://twiki.cern.ch/twiki/bin/view/EMI/EmiPptInstructions>.

The official EMI PPT application can be found at:



<https://pptemi.cern.ch>

#### 8.4. BUDGET TRACKING AND COST CLAIMS

Budget tracking is done using an internal function of PPT, which allows the EMI PO to upload budget cost claims received from the partners and create consolidated views of the overall budget consumption. Cost claims are provided every quarter by the partners using a spreadsheet template. In addition, every fourth quarter in occasion of the periodic reviews, the official cost claims from each partner are inserted in the Form C of the EC NEF online application for further processing by the EC.

#### 8.5. WEBSITES

EMI has two separate web sites, one dedicated to the general public and one to the EMI members. The public web site is described in the milestone MNA2.1 - Project web presence. The internal web site is installed at CERN, uses the TWiki engine and contains topics relevant to the activities of the project members (news, events, procedures, documents, templates, etc).

The web sites can be found respectively at:

<http://www.eu-emi.eu>

<https://twiki.cern.ch/twiki/bin/view/EMI/WebHome>

#### 8.6. MEETINGS

Official project and work package meetings and related agendas are managed with the Indico system at CERN and are expected to be accessible to all project members with the exception of the PEB meetings, where confidential matters may be discussed:

<http://indico.cern.ch/categoryDisplay.py?categId=2560>

The EMI Indico instance is divided in various categories, like CB, ECB, PEB, PTB, Conferences and Workshops, etc.

Meetings can be held in person or using one of the available conference and video conference tools. The CERN Alcatel System can be used for official meetings, but requires using standard telephones. It is of high quality, but it carries a cost for external, non-CERN participants. Alternatively, Internet-based audio and video conference tools can be used, like EVO<sup>4</sup>. A dedicated EMI community has been created in EVO in the “International Projects” category and can be used to host all EMI-related video conferences.

Minutes of the meetings and other relevant material must be stored within Indico and attached to the respective agenda page. The material is automatically stored in the CDS, which serves as document storage back-end for Indico. Public material can therefore also be exposed through the OpenAIRE portal.

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<sup>4</sup> <http://evo.caltech.edu/evoGate/>

## 9. CONCLUSIONS

This document describes the Quality Assurance and Progress Monitoring Plan for the EMI project.

The overall quality assurance strategy of the project is based on standard best practices. It includes a mechanism for continual improvement of the processes through periodic assessments and modifications as described in section 6.6.

The procedures and methods described in the document are subject to continuous revision by the QAMT and other project members to make sure it is kept up-to-date and in line with the project requirements. Although no formal revision of the document is foreseen in the form of new deliverables to the EC, the document can be updated at any time and the latest version will be provided to the EC and the reviewers in occasion of the periodic reviews to make sure it always contains relevant and meaningful information.

The assessments and any consequent changes will be described in this document and reported in the quarterly and periodic reports.