GUIDE FOR APPLICANTS

Second RobMoSys Open Call - 2nd cut-off

Contents

Definitions

Instrument:	Type of RobMoSys third-party contract outlining the contributions a successful applicant can make to RobMoSys. This Open call distinguishes three of these "Instruments", each of them with a specific scope, an individual funding scheme and distinctive expected results & impact.
RobMoSys Ecosystem:	The collection of assets (tools, models, software components, application pilots, guidance documents) and services (e.g. for adoption, coaching) issued by RobMoSys, which are developed, maintained and evolved by the RobMoSys Community.
RobMoSys Community:	It is the keystone for the sustainability of the RobMoSys project. The functions of the RobMoSys Community include, but are not limited to: (i) developing RobMoSys models (see: https://robmosys.eu/wiki/model-directory:start) , software components and tools (see: https://robmosys.eu/wiki/baseline:start) to be released/hosted in open source, (ii) operating dedicated code repositories, (ii) build chains, test facilities, fostering exchanges between RobMoSys partners and industry partners, (iv) managing the quality and maturity of RobMoSys tools, (v) ensuring open innovation through the sharing of the research, development, and maintenance efforts as far as possible, fostering sustainable commercial services and ecosystems around the RobMoSys tools.
Integrated Technical Project (ITP):	A third-party RobMoSys-funded project composed of one or more legal entities aiming at adopting, developing or boosting the RobMoSys Ecosystem.
RobMoSys Academy:	The set of structured resources providing guidance and support for RobMoSys stakeholders, including methodological guidance, tutorials, training, demonstrators and coaching.
Coaching Support:	The RobMoSys project assigns one member of the core consortium to each ITP with the following role: to assist the assigned ITP in aligning with RobMoSys background in a consistent way; to serve as main link between the ITP and the RobMoSys consortium for questions or requests or to trigger potential collaborations or interactions between ITPs.
Project Steering Committee (SC):	The RobMoSys Project Steering Committee comprises one representative from each of the core partners of RobMoSys. The Steering Committee is involved in evaluation and selection process to ensure fit between the selected projects and overall goals of RobMoSys.
Expert Evaluators:	The experts, independent of the RobMoSys consortium and of any proposer, with the role of assessing the proposals submitted in response to the Second RobMoSys Open Call.
Expert Rapporteurs:	They are responsible for drafting the consensus report (CR), it can be either one of the evaluators involved in the evaluation of the proposal or an additional expert.

1. General Aspects

1.1. Why this Guide

This guide aims at supporting applicants addressing the *Second Open Call of RobMoSys.* It provides the relevant administrative details. The main purpose of this guide, though, is to outline to the applicants the requirements of the RobMoSys project in order to facilitate proposal matching with the three different *Instruments* embraced in this Second Open Call as well as the overall objectives of the RobMoSys project. The three instruments differ in purpose and expected impact, and hence are subject to different evaluation criteria. The next sections explain the contributions expected from proposals geared to these 3 instruments which can vary considerably.

The RobMoSys Wiki (https://robmosys.eu/wiki/) provides technical details on the RobMoSys approach and on technical topics mentioned in this document. A reading guide to the wiki which is focused on the Second Open Call is available at https://robmosys.eu/wiki/open-call-2.

The frozen copy/snapshot of the wiki is taken and the archived wiki is going to be available at http://www.robmosys.eu/wiki-sn-03/.

1.2. Objectives of the RobMoSys project

RobMoSys's vision is that of an agile, multi-domain, model-driven European robotics software ecosystem. It will consist of a specialized set of players with both vertical and horizontal integration levels, providing both widely applicable software products and software-related services. This ecosystem will be able to rapidly address new functions and domains at a fraction of today's development costs.

RobMoSys wants to coordinate the efforts and activities of the community in order to realize a step-change towards a **European ecosystem for open and sustainable industry-grade software development for robotics.** Specifically, RobMoSys addresses the following goals:

- **RobMoSys** envisions an integrated approach built on top of the current code-centric robotic platforms, by applying model-driven methods and tools.
- **RobMoSys** will enable the management of the interfaces between different robotics-related domains in an efficient and systematic way according to each system's needs.
- **RobMoSys** aims to establish Quality-of-Service properties, enabling a composition-oriented approach while preserving modularity.
- **RobMoSys** will drive the non-competitive part of building a professional quality ecosystem by encouraging the community involvement.
- **RobMoSys** will elaborate many of the common robot functionalities based on broad involvement of the community via two Open Calls.

Towards that purpose, RobMoSys **creates a consolidated EU Digital Industrial Platform for Robotics** which establishes a common methodology for software development, improves tools and fosters interoperability by model interchange and composability. The RobMoSys approach aims at solving critical issues in the area of robotics software development observed in industry. Moreover, it draws a clear migration path for a step-by-step adoption of existing model-driven software and tool assets, the so-called RobMoSys ecosystem, for interested early adopters.

The RobMoSys Open Calls are one of the means implemented by the RobMoSys core consortium to achieve this goal. The Second Open Call of RobMoSys focuses on the following aspects:

- **Industry-Driven Ecosystem.** RobMoSys defines a model-based ecosystem of assets and services to help the robotics industry to improve their software/system engineering practices. We look for proposals joining us in our effort to create this ecosystem and to demonstrate with real industrial cases your own success story.
- **Towards a Strong RobMoSys Community.** We call for expert groups willing to be coached by members of the RobMoSys core consortium, in order to implement the RobMoSys concepts. Successful applicants must be ready to advance the RobMoSys way of thinking, and to go for real world examples in line with the RobMoSys industrial pilots (developed by the RobMoSys core consortium).

1.3. RobMoSys Call Principles

RobMoSys strives for high-quality projects funded via the FSTP instrument, FSTP standing for Financial Support to Third Parties, that will facilitate the accomplishment of the goals and impact targeted in RobMoSys. Therefore, proposals will be evaluated not only on the merit of their excellence but mostly on their fit with the RobMoSys goals and approach.

Proposals applying successfully for funding under the technical instruments (see Instrument no 1 and 2 below) must deliver components and documentation that meet the *usability* and *reusability* expectations of engineers in industry who develop *reliable* and *predictable* robotic applications. The adherence of the developed components to the (re)usability expectations will be assessed and verified during the runtime of the selected FSTP projects at least within the RobMoSys Community.

The core aspects of the **technical approach** (instruments 1 and 2) that RobMoSys wants to advocate and support are:

- **better models, better tools, better software**
- rich data sheets for software components
- more inter-component communication patterns, with (richer) configuration capabilities
- horizontal and vertical composition
- system-level performance metrics and explicit dependency relations

Integrated Technical Project (ITP) proposals **must** always realise the **first ambition**, and all of the other aspects that are relevant for each specific instrument.

The cornerstones of the **Coaching Support** (see Instrument 3) by members of the RobMoSys consortium are:

- open communication forum (Discourse software): https://discourse.robmosys.eu/
- internships at RobMoSys consortium member premises
- inter-ITP workshops and workshops open to the broader robotics community (e.g., at European Robotics Forum, in Summer Schools (co)organised by RobMoSys, etc.)
- collaborative improvements of RobMoSys' technical and educational Wiki material (RobMoSys Academy).

2. Instruments

An instrument is a type of RobMoSys third-party contract outlining the contributions a successful applicant is expected to make to RobMoSys. This open call defines three (3) instruments, each of them being characterized by specific contributions, a specific funding scheme, distinct, targeted results and impact as well as own evaluation criteria. Figure 1 shows the main funding figures for each instrument.

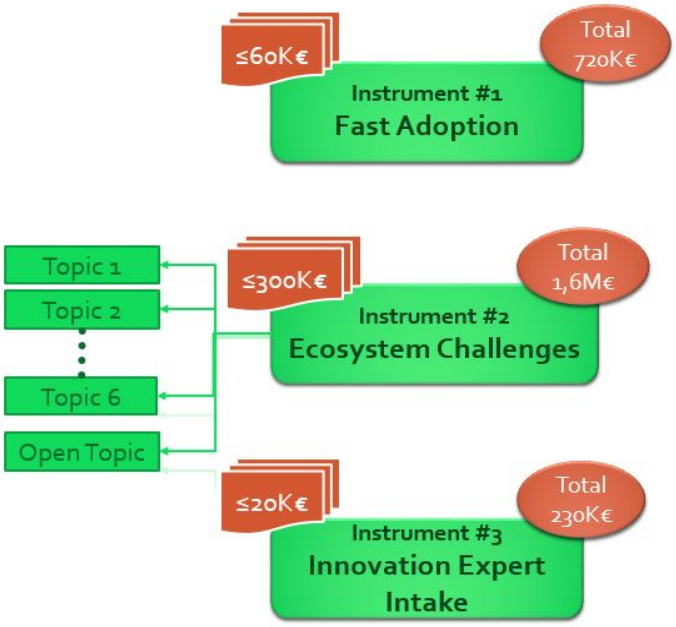

Figure 1. The RobMoSys instruments for the Second Open Call

2.1. Instrument #1: Fast Adoption

With this instrument, RobMoSys wants to boost fast adoption of the RobMoSys approach in industry. It focuses on SMEs and small teams in large industrial companies, target groups ranging from software component suppliers to robotics system builders. The funded ITPs must develop RobMoSys-conformant pilots (industrial case studies) based on existing assets (software and tools from the RobMoSys ecosystem), or provide software components conformant to the RobMoSys pilots.

Instrument #1	Fast Adoption
Expected runtime	≤6 months
Total Indicative Budget	720 KEUR
Recommended Funding per Proposal	60 KEUR
Funding rates	100% for any entity (including 25% indirect costs)
Cut-off dates	April 30, 2019 October 31, 2019
Eligible activities	- Experimentation with RobMoSys Pilots - Software development - Development of demonstrators (showcases, demos, videos) related to own industrial cases in line with RobMoSys Pilots - Co-operation with other members of RobMoSys Community - Participation in inter-ITP workshops organized by RobMoSys (at least one per project)
Expected results	- Demos (e.g., videos) - Adoption Report - Application (usage or implementation) with at least two RobMoSys-conformant components

Targeting the right scope in view of runtime and funding is key: ITPs funded under the umbrella of Instrument 1 are not expected to build applications with fully RobMoSys-conformant software components. **At least two** of these RobMoSys-conformant components have to be implemented, though. An overview of RobMoSys-conformant components is provided here: https://robmosys.eu/wiki/model-directory:start. That is the baseline to demonstrate the value of the composability within RobMoSys' (data sheets, system composition patterns and communication patterns), to let the pilot application deal with relevant **cause-effect constraints** between components at the system level.

RobMoSys describes the path of gradual familiarization with the RobMoSys approach and community interaction (see Annex 1).

A project proposal must convincingly demonstrate that the project consortium is ready not to work in isolation, but achieve the targeted results in co-operation with other members of the RobMoSys Community. The RobMoSys consortium will organise dedicated workshops to help projects to achieve this goal, and to have constructively critical discussions on each other's approach, design and software. Project proposals must explicitly plan to participate in such workshops, at least one during the project runtime.

2.2. Instrument #2: Ecosystem Challenges

Instrument #2 was available during the first cut-off date of the RobMoSys second open call. There is no possibility to apply to this instrument within second cut-off date (August 1st - October 31, 2019).

2.3. Instrument #3: Innovation Expert Intake

This instrument looks for experts that offer their expertise as a service. RobMoSys wants to take them on board in order to push innovation and strengthen the RobMoSys community. Expert services can focus on either supporting the RobMoSys Academy or the RobMoSys technology.

Experts with the following background could make a valuable contribution to the RobMoSys project:

- experts solely involved in the ROS-ecosystem so far, but wanting to get actively involved in RobMoSys now
- experts in real-time embedded systems willing to link their concepts to RobMoSys
- deep software engineering experts wanting to identify how to overcome deficiencies in model-driven tooling workbenches
- experts in automotive software engineering wanting to push forward a link to their resource management
- experts in DDS middle-ware willing to push forward the mapping of RobMoSys communication patterns onto this middle-ware
- experts in world modeling in robotics
- experts in robotics ecosystem

The applicants with other expertise relevant for RobMoSys are also welcome.

Instrument #3	Innovation Expert Intake
Expected runtime	≤6 months
Total Indicative Budget	230 KEUR
Max Funding per Proposal	20 KEUR
Funding rates	100% of personnel costs and travel expenses for any third party entity (no indirect costs)
Cut-off dates	April 30, 2019 October 31, 2019
Eligible activities	- Advising activities at the premises/laboratories of RobMoSys partners - Exploitation of all community-building channels - Identification of projects and applications in terms of suitability to expert's contribution - Co-operation with other members of RobMoSys Community - Participation to Innovation Experts workshops organized by RobMoSys (at least one)
Expected results	- Implementation of community building activities described in the project application - Final Expert Report

As a precondition of their expert involvement, the selected experts must be willing to familiarize themselves with the RobMoSys approach, to actively participate in technical workshops, to meet with RobMoSys partners in their labs, to contribute to the RobMoSys community building, or getting involved in specific ITPs. Please mind that only applications filled by legal entities - not by individual experts - are eligible. Even though the application must be filled by a legal entity, the CV of the individual expert is a fundamental part of the evaluation of proposals under Instrument 3. Once selected for funding, the expert representing the legal entity CANNOT be replaced!

For proposals in this instrument, it is an absolute **must** that the expert exploits all community-building channels offered by RobMoSys and identifies (pro-actively and with the help of the coaches of RobMoSys) all projects and applications that can profit most from the expert's contributions.

This instrument is, by necessity, very flexible in terms of the contribution which would be eligible if suggested. However, some contributions are considered as fundamental by RobMoSys:

- *Adoption Measures*: How to improve the fit between RobMoSys and the needs of its user community for easy adoption and how to improve the RobMoSys migration and adoption paths?
- *Digital Infrastructure*: How to improve the RobMoSys digital platform for easy accessibility to software components and for easy interoperability?
- *Market Uptake*: How to develop the RobMoSys strategy for easy management of associated ecosystem technologies (towards marketplaces), and for and for easy alignment with industrial needs?
- *Community Creation*: How to contribute to growing RobMoSys community?
- *Academy Growing*: How to enrich the concept and service portfolio of the RobMoSys Academy, including tutorial, training, methodological guidance and demonstrators

Applicants are requested to demonstrate clearly in their proposals that they are very well aware of the areas in which their specific expertise fits best the project goals and the ongoing developments. RobMoSys is interested in building a long-term relationship with the experts. Applicant are further requested to pro-actively discuss the content of their contributions with RobMoSys, using the RobMoSys communication and interaction channels.

3. Proposal submission

The proposal will be submitted via the proposal submission platform. The platform will provide:

- The functionalities to enter general/administrative proposal information and partner data.
- The functionalities to upload a completed proposal document, providing full scientific details of the proposal.
- Information which is required to avoid any potential conflict of interest
- Contacts for administrative, scientific / technical and RobMoSys-related questions
- The link to a ticketing system to address your requests / enquiries

It is the proposers' responsibility to ensure the timely submission of proposals. The complete proposal consists of (i) the completed and uploaded proposal template and (ii) the completed web forms.

Once the requested information has been entered, the portal will allow you to download a combined scientific-administrative document for your reference. You can submit as many times as you like and the version submitted most recently before the deadline will be considered for evaluation. However, the deadlines given in these guidelines are binding and proposals submitted after the deadline will not be taken into consideration.

Shortly after the effective submission of the proposal, an acknowledgement of receipt thereof will be sent to the e-mail address of the proposal coordinator named in the submitted proposal. The sending of an acknowledgement of receipt does not imply that a proposal has been accepted as eligible for evaluation. For any given proposal, the ITP coordinator acts as the main point of contact between the ITP team and RobMoSys.

Upon receipt by RobMoSys, proposals will be registered and their contents entered into a database to support the evaluation process. Eligibility criteria for each proposal will also be checked by RobMoSys before the evaluation begins. Proposals that do not fulfil these criteria will not be included in the evaluation. A proposal will only be considered eligible if it meets all of the following conditions: (i) it was received before the deadline given in the call text, (ii) template and web forms (all sections!) have been completed and (iii) the eligibility criteria set out in Section 3 – Activities, Results and Funding per Instrument are met.

4. General Conditions

The activities eligible for funding as well as the funding rates differ considerably between the different instruments. The relevant information is provided in the overview tables for each of these instruments.

Cost categories eligible for funding:

In RobMoSys open-call ITP budget, mainly address personal expenses (staff and travel).

In Instruments #1, up to 25% of the budget can be reserved for consumables needed to cover activities related to use case implementation in Pilots. Equipment costs are not eligible. Third parties are expected to provide the entire equipment necessary to perform the activities (robotic platforms, etc.) themselves.

Participants of Instruments #1 are allowed to sub-contract 10% of the budget, but sub-contracting should not cover core activities (see above overview tables per instrument). Subcontracted activities have to be specified very clearly in the proposal.

Each proposal for an ITP will include justifications of costs and resources. Checking the consistency between these costs and the expected work of the ITP will be part of the evaluation of ITPs.

Funding rates

The following funding rates apply to individual instruments of the Second RobMoSys Open Call:

Instrument #1: 100% funding rate for all entities, including 25% indirect costs.

Instrument #3: 100% funding rate of direct personnel and travel costs, **no indirect costs.**

Inter ITP workshops:

All accepted ITPs commit themselves to participate in inter ITP workshops. The purpose of these workshops is to better harmonize the contributions of the different ITPs to the RobMoSys platform and ecosystem and to strengthen cooperation among ITPs. It is intended to have a minimum number of inter ITP workshops as indicated in Section 2 (per Instrument) during the runtime of ITPs

Payment schemes:

In the RobMoSys ITPs, one or more organizations can apply for funding by submitting a proposal describing their goal, the technical plan to achieve it, and an estimate of the involved cost.

Third-party beneficiaries will receive their payments according to the following schedule:

1. One pre-financing payment of 40% of the funding, within 30 days from the entry into force of the ITP agreement;
2. Final balancing payment of all the funding, not exceeding the initial budget, within 60 days from receiving the final ITP report.

Key Performance Indicators:

ITP proposals suggest a limited but sharp set of individual KPIs, these KPIs will be fine-tuned during the preparation of the contract.

Entities eligible for funding:

Because of the expected step change contributions, the Call welcomes, in particular, consortia offering complementary, multi-disciplinary competences that go beyond the mainstream robotics community; for example, robotics experts teaming up with software engineering people, or tool builders, or experts from automotive, aerospace, embedded cyber physical systems.

Instrument 3 is looking for entities, both non-profit and for-profit, employing experts with a background which are described in section 2.3.

In RobMoSyS, financial support may be provided to any legal entity possessing a validated Participant Identification Code (PIC). At the moment of submission, though, the entity can apply with the provisional PIC. Once these conditions are met, financial support can be given to natural persons, public or private bodies, research organizations, non-profit organizations, small and medium enterprises, international organizations, international organizations of EU interest, established in an EU Member State or in an Associated Country.

Maximum funding and possibility to participate in several proposals:

There are no restrictions regarding the number of proposals in which an entity can participate. However, the funding for the beneficiary (as defined by the EC[1]) will not exceed 250,000€ (even if a party participates in more than one ITP), restriction of shifts between partners in an ITP concerning this matter will be part of the contract.

5. Ethical issues

Research activities in Horizon 2020, and particularly in RobMoSys, should respect fundamental ethical principles, particularly those outlined in "The European Code of Conduct for Research Integrity". Therefore, questions about ethical issues are to be addressed in the proposal text, if ethical issues apply to an ITP, before and during the runtime of the research activities within RobMoSys, including the approval by the relevant committees.

6. Pre-proposals

As a special service to potential applicants, pre-proposals can be submitted via the RobMoSys Open Call Platform during the first nine weeks after publication of the call. A member of the staff of the RobMoSys Project will respond to applicants within a reasonable period, if longer than five business days the applicants will be informed. The response will be limited to clarifying whether the proposal fits into the scope of the call and is eligible with respect to avoiding conflict of interest with the core consortium. Please note that it is not mandatory to submit one and it has no influence on the evaluation of the full proposal. Pre-proposal should be based on the Proposal Template.

7. Evaluation Process

Proposal writers are strongly advised to read the accompanying document to this "Guide for Applicants", namely the "Guide to Evaluators": by understanding what the RobMoSys Consortium expects from Evaluators, proposal writers should be able to focus their ideas on what is really important, and to improve the quality with which their proposals can be evaluated.

Conflict of Interests (CoI)

The applicants must take all measures to prevent any situation where the impartial and objective implementation of the project is compromised for reasons involving economic interest, political or national affinity, family or emotional ties or any other shared interest ('conflict of interests'). They must formally notify to the RobMoSys Consortium without delay any situation constituting or likely to lead to a conflict of interests and immediately take all the necessary steps to rectify this situation.

Moreover, as the RobMoSys Core Consortium is going to be involved in the evaluation and selection process, it is necessary to ensure from the very beginning that this process remains as transparent and unbiased as possible. A clear violation of impartiality could arise from either legal or financial ties between any of the applicants and any of the members of the core consortium. Examples of such situation include (but are not limited to):

- Member of the core consortium (either institution or any of the persons involved in the implementation of the project) being shareholder of the applying institution
- Member of the core consortium (either institution or any of the persons involved in the implementation of the project) benefitting financially from success of an application

[1] http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/amga/h2020-amga_en.pdf

- Any employee of the applying entity being simultaneously an employee of any of the members of the core consortium.

In order to avoid such situations, the applicants will be required to state any relationships with the core consortium during the application process via the online submission platform. Reporting such relationships does not immediately mean exclusion from the call – each such case will be analysed individually, and the decision will be included in the evaluation report. On the contrary, failure to report a potential CoI in case any doubtful relationship is discovered will be automatically considered a disqualifying factor.

Annex 1: RobMoSys Adoption Path

RobMoSys defines a process for stepwisely intensified adoption levels of the RobMoSys approach and community interaction (Figure 2).

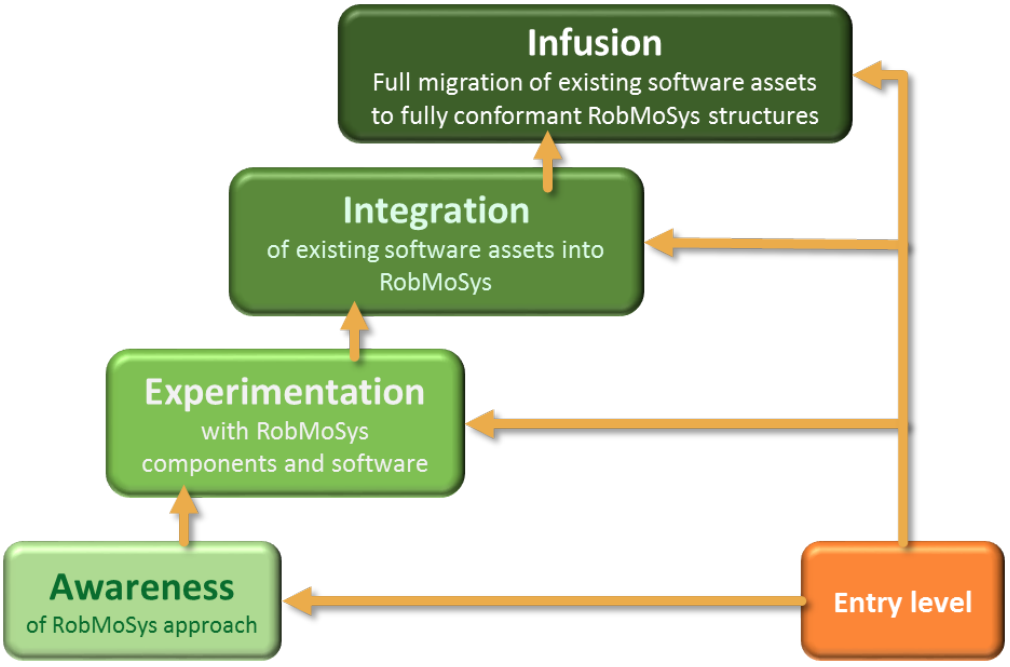

Figure 2. The RobMoSys Adoption Path

Level 1: Awareness. This is the entrance point for RobMoSys newcomers and provides basic information for adoption. RobMoSys provides a structured Tutorial, as well as User Stories (https://robmosys.eu/user-stories/). Other important RobMoSys awareness means are newsletters, Brokerage Days, workshops organized by RobMoSys partners, and Discourse Forum. The main goals of this level are to:

- stay abreast of available RobMoSys principles, modelling structures and tools,
- understand applicability and limitations of the RobMoSys approach to the development of robotics software,
- actively seek the implementation of RobMoSys to appropriate, real software engineering problems in industry, and
- touch base with potential users and verify the need for RobMoSys to adopt its approach and technologies.

Level 2: Experimentation. It implies to set up and run experimental cases to understand and test the RobMoSys approach. RobMoSys facilitates this by providing two toolchains with User Manuals and Usage Scenarios to be reproduced. In addition, a set of RobMoSys pilot skeletons (see one page descriptions of each of these pilots provided as additional information for this call) are available to work on real-world case studies. Finally, RobMoSys fosters "internships": motivated people can spend some time in RobMoSys partner labs, to get embedded in the RobMoSys approach, and to learn first-hand from the core developers within RobMoSys. The main goals stading behind this level of engagement with RobMoSys are to:

- gather hands-on experience with the RobMoSys approach,

- find answers to technical questions and hypothesis by conducting controlled experiments,
- identify any technical constraint to apply RobMoSys in real-world cases, and
- improve, fine tune and extend all RobMoSys information (tutorials, wiki,...). Not in the least by adding to a repository of "best practice designs" of concrete robotic systems.

Level 3: Integration. This is a first step of the RobMoSys migration path. It implies the usage of RobMoSys technologies (models, software components and tools) by robotics development users. These users may keep their existing assets and connect to RobMoSys by using pre-defined mechanisms such as the RobMoSys Mixed Port Component, or partially conform to /convert with RobMoSys structures. The main goals of this level of engagement with RobMoSys are to:

- start with an early adoption of the RobMoSys approach, using RobMoSys architectural patterns and associated tooling,
- support smooth transition to full RobMoSys benefits (compositionality, predictability), by still reusing existing components and systems, and
- develop or adapt (existing) pilots demonstrating the added value offered by RobMoSys in the context of real industrial settings.

Level 4: Infusion. This step implies the full migration of existing assets to fully conformant RobMoSys structures. The main goals are to:

- show full adoption of the RobMoSys approach in an organization,
- demonstrate complete business cases showing a clear Return of Investment (RoI), and
- understand pros and cons of how RobMoSys permeates (an area of) an organization.

The advantage of these different levels (different entry levels with different support from our side) is that we can produce win-win situations at various levels of engagement: migration pilots, coaching, expert advice, and incremental adoption.