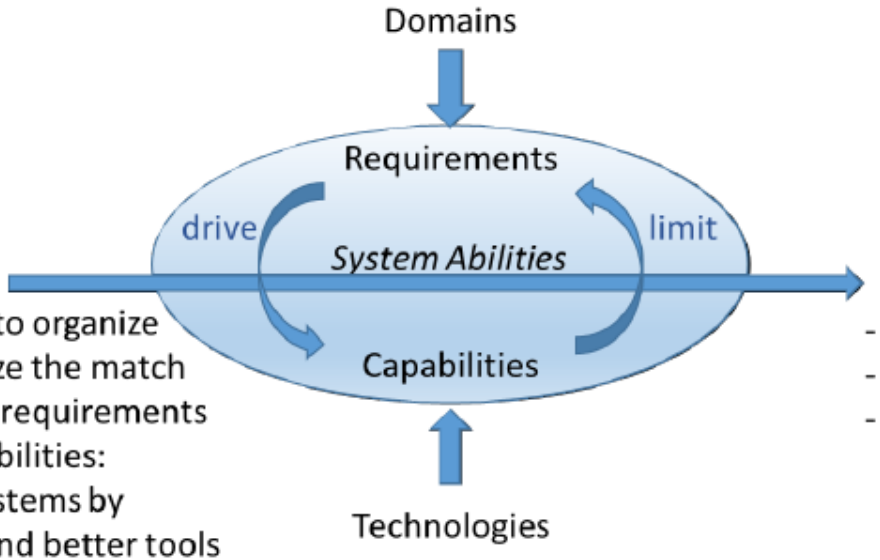
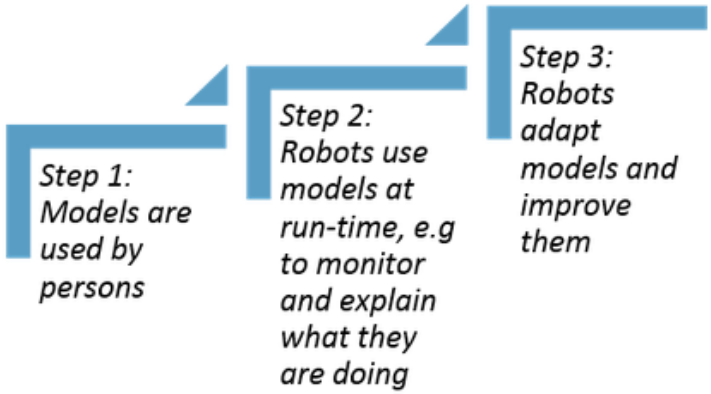
Topic Group Contributions:

MAR Update Section „5.2 Systems Development“
„Better Tools and Processes for Better Systems“



We help to organize and realize the match between requirements and capabilities: better systems by models and better tools

- Applications
- Building blocks
- Development tools



Topic Group Contributions:

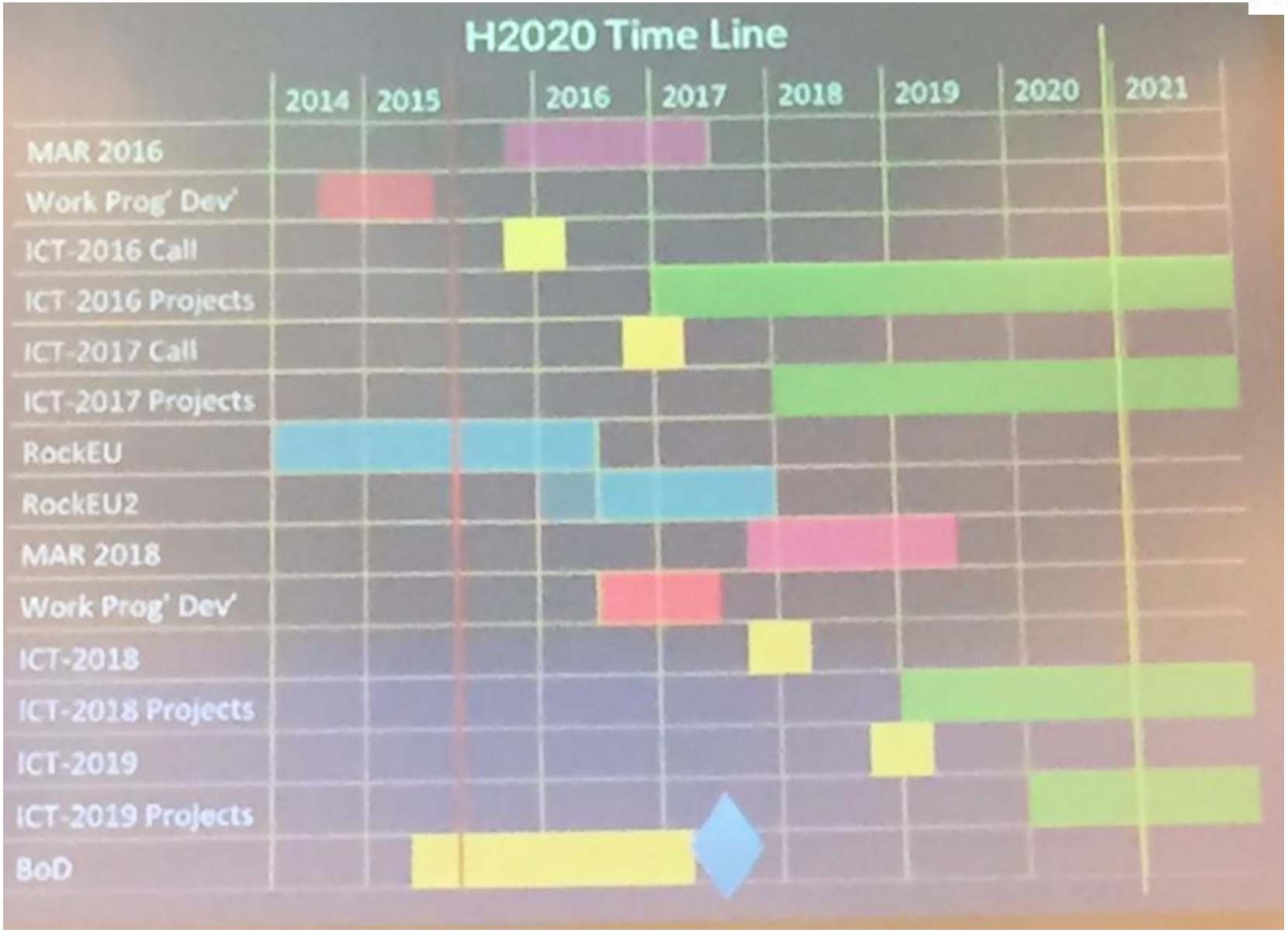
MAR Update Section „5.2 Systems Development“
„Better Tools and Processes for Better Systems“

“Better Tools and Processes for Better Systems”

To create robotic systems for real-world applications, the need for a systems engineering approach has been identified which goes well beyond the current state-of-the-art regarding systematic processes, methods and models, and tools:

- Software and system design methodology and capabilities are seen as the “make or break” factor in the development of complex robot systems.
- Development needs to concentrate on "total lifetime (software) support" - from the initial product idea, to the end of the run-/use-time … and beyond.
- Openness and standardization are seen as important attributes for the further spread of robotics technology and for creating a business ecosystem for robotics
- Model based methods are needed at the core of all complex robot systems and through the lifecycle. To address increasing complexity, a shift from human-oriented document-driven approaches to computer-assisted tools and a computer processable model-driven approach is needed in order to gain from design support processes. Models can be used in different ways, which are reflected by the envisioned step changes illustrated in Fig. 1.
- On contrast to general, standard (software) engineering and algorithm development, in robotics application development additional constraints that have to date been abstracted away, must be taken into consideration. This requires a shift in viewpoint, focus, paradigm, and methodologies related to the development process and the semantic description of the building blocks and processes.

TG Coordinator Meeting / 09.07.2015 Brussels



"**FSTP**": Funding Support for Third Parties, ECHORD++ and EUROC are FSTP type actions. This type of action offers cascaded funding for third parties.

			ability.	
d)	IA Large (FSTP) *€10M*		The open development and dissemination of integrated sets of tool chains and applications that support the development of complex robotics systems including multiple actor systems. The resulting eco-system of development tools should use commonly agreed ways of describing robot systems and system building blocks and their interaction. The eco-system should be flexible and able to accommodate a diverse range of end application requirements in a broad range of different domains. Proposals must develop the eco-system, provide mechanisms for its dissemination and stimulate community engagement in both the process of development and subsequent deployment of the eco-system. Key to the success of the proposal will be support for modularity, composability, re-usability, ease of	Defined in MAR 2016/2017 Must focus on the delivery of tool chains that provide integration through common interfaces to avoid fragmented solutions and promote modularity.

			use and the adoption of existing and proposed standards within both the system and its components. The proposal is also expected to develop mechanisms to ensure consistent quality in the dissemination of the eco-system components. The proposal is expected to build on existing systems and structures providing harmonization across and integration into the eco-system.	

HORIZON 2020 - Work Programme 2016 - 2017
Information and Communication Technologies

ICT-26-2016: System abilities, development and pilot installations

...

Integrated sets of common tool chains and real-world test installations are increasingly needed to support the development of complex robotics systems. The challenge resides in the need for open development and dissemination of common development tools and the provision of wide access to realistic testing environments for the end user community, especially SMEs. Robot testing and innovation facilities are starting to emerge in Europe but are underdeveloped in terms of their infrastructure and the facilities they offer.

...

Draft H2020 Work Programme 2016-2017

Scope:

c. **Innovation Actions** on systems development technology:

The action will address the open development and dissemination of integrated sets of tool chains and building-block applications which support the construction of complex robotics systems. This will result in a European-level ecosystem of development tools using commonly agreed ways of describing robot systems and system building blocks and their interaction. The ecosystem should be flexible and able to accommodate a diverse range of end application requirements in a broad range of different domains. Proposals must aim at developing such an ecosystem, provide mechanisms for its dissemination and stimulate community engagement in its development and subsequent deployment.

Key to the success of this action will be support for modularity, composability[24], re-usability, ease of use and the adoption of existing and emerging standards within both the system and its components. The action is also expected to build on existing systems and structures.

The action may involve financial support to third parties in line with the conditions set out in Part K of the General Annexes. The consortium will define the selection process of additional users and suppliers for which financial support will be granted (typically in the order of EUR 50.000 – 250.000[25] per party). Minimum 50% of the EU funding requested by the proposal should be allocated to the purpose of financial support to third parties.[26]

The Commission considers that System development tools proposals requesting a contribution from the EU of between EUR 5 and 8 million would allow this area to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. At least one proposal will be supported within actions on systems development technology.

Draft H2020 Work Programme 2016-2017

Scope:

...

[24] Composability is defined as the ability to combine and recombine building blocks to fulfill different functions. Building blocks may be at different levels of granularity ranging from components to systems of systems. Composability applies to all aspects of the design and development of systems.

Expected Impact:

...

The expected impacts of system development tools actions are:

- Enhanced productivity of RAS through high quality tools
- Wide acceptance of new, efficient and flexible system development tools across the development community and in the marketplace.

Topic Group Meeting in Munich / 21.07.2015

- **see email in topic group mailing list with further information / 07.08.2015**

In order to identify, prioritize, guide and underpin with relevance the next steps in the MAR, **we collect a set of real industrial use cases in all kinds of domains**. The use cases should focus onto what should be the next step changes for systems of systems? This is an open process first collecting and then iteratively refining and clustering the use cases as well as rating them via a survey. Contributions from industry are highly welcome!

Please add your use cases directly in he following online document, this link is currently open and should stay within the TG:

<< the link is available within the topic group >>

If you don't feel comfortable editing this document for good reasons, you may send (in exceptional case) your use case to the TG mailing list.

With kind regards,
Christian Schlegel and Reinhard Lafrenz

- **original plan:**
  - **have all topic groups meet at the same time / place (e.g. Brussels, organized by euRobotics aisbl)**
    => no chance to find a date in this year, postponed till January
    => will check whether to have another TG meeting, not yet coordinated