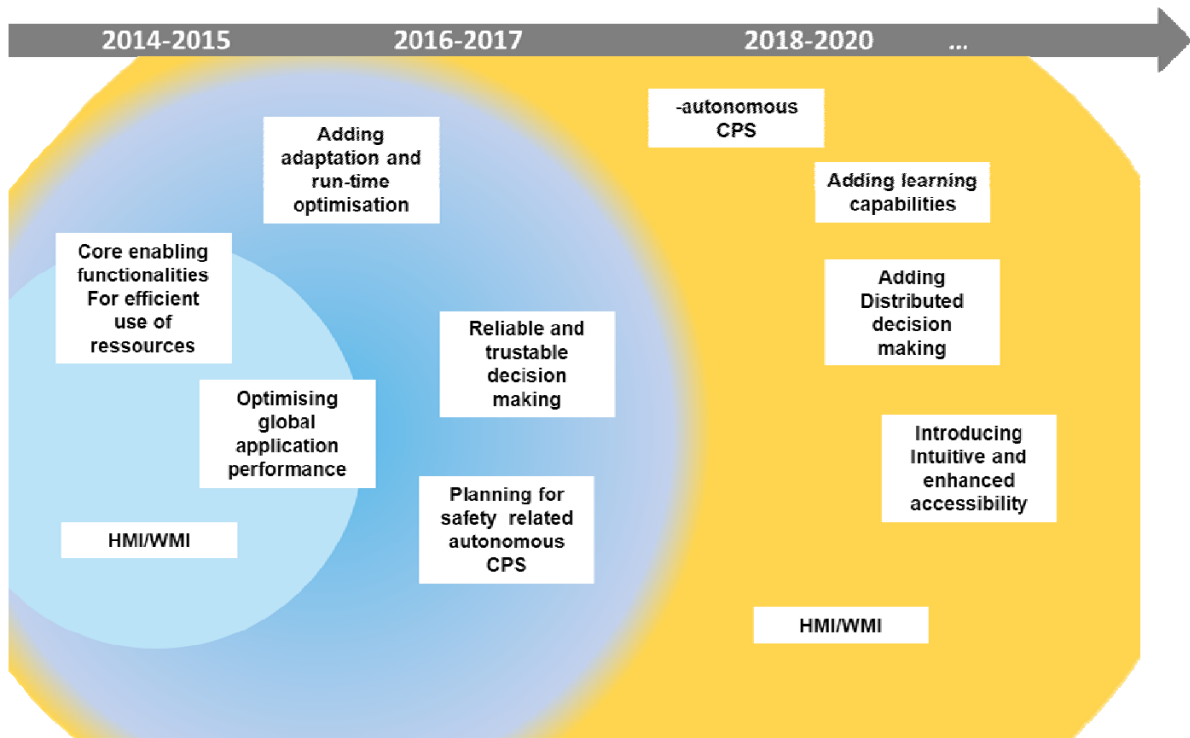


C- Autonomous adaptive and cooperative Cyber-Physical Systems

- **Short-term:** for developing core enabling functionalities for efficient use of resources (computing, power,...) and for optimizing global application performance and life-cycle costs for semi-autonomous CPS.
- **Medium-term:** For adding adaptation and run-time optimisation capabilities, as well as reliable and trustable decision making and planning for safety-related autonomous CPS.
- **Longer-term:** For adding learning capabilities and distributed decision making ; for introducing attractive, intuitive and enhanced accessibility for users for autonomous CPS including Human Machine Interface/World Machine Interface (HMI/WWI).



This cluster C may consider different applications contexts and objectives, for example home context (aiming at assisted care) or road traffic (aiming at autonomous cars). For each application context, the phases of the roadmap should be mapped to specific end-user functionalities.

Research Challenge	Expected Impact (Sub-Challenges)	Ph1 2014 - 2015	Ph2 2016 - 2017	Ph3 2018 - 2020	Cross reference to Annex1
C - Autonomous adaptive and cooperative of Cyber-Physical Systems					
C.1 Optimal control using autonomous CPS	Efficient use of resources (computing, power, development effort ...) and optimize global application performance and life-cycle costs.				1.1
C.2 Development of mechanisms of autonomous CPS	Design, planning, control and operation for autonomy and runtime adaptation (configuration, behavior), including monitoring and on-line diagnosis.				1.3
C.3 Development and control of cooperative and autonomous SoS (e.g car networks, smart grids, adaptive swarms)	Cost efficient cooperative systems with cooperative, distributed situation awareness and solution finding, decision making, planning and execution, including self-healing (e.g., Adaptive swarms				1.3
C.4 Seamless Interaction	Deliver Interoperability standards, middleware. Enable new functionalities trough interconnection (e.g systems for reduction of fatalities or protection of the environment) while protecting the privacy of the users.				5.1
C.5 Real-time sensing and networking in Challenging environments	<i>New sensors operating in harsh environments for process industries and manufacturing plants;</i> Reliable real-time sensor data fusion and situation awareness				5.2; 5.4
C.6 Reliable and trustable decision making and planning for safety-related autonomous CPS/SoS	Extension to distributed CPS/SoS Better (distributed) reliable decision making and planning with autonomous CPS/SoS				5.3
C.7 HMI and WMI CPS (common to B System design)	Attractive, intuitive and enhanced accessibility for users – e.g. drivers assistance				5.4