

# Robotics and automation

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# Robotics and automation roadmap

	Short term	Medium term	Long term
Industry challenges	Advanced manufacturing process and technology		
	Smart product design and manufacturing process		
	Automation for responsive manufacturing		
	Future skills for automation		
	Human and automation symbiosis		
	Improve adoption of automation in highly regulated markets		
	Manufacturing data for traceability		
	Manufacturing efficiency for sustainability		
Technology capabilities			Manufacturing safety
	Accessibility of automation		
	Automation for circular economy		
	Collaborative robotics		
	Digital interface for robotics (interoperability)		
	Flexible automation		
	Modular automation		
	Skills for automation		
	Representation model (digital master)		
		Adaptive automation	
		Business models for automation	
		Legislation and standards database platform to aid industry	
		System verification and validation	
HVM Catapult developments	Autonomy		
	Develop open-source model-based design		
	OPP tech structure		
	Standards and verification		
			User interface (easy to use)
		Reconfigurable hardware	
		Finance	
	Automation process		
		Control adaptive system	
	Develop solutions for new business models		
		Collaboration in supply chain	
	Models (kinematic, state, logic), (real time) communications		
	Open libraries		
		AR/VR	
			Skills capability

