

The dynamic capabilities of resilient smart cities

The digitization of the economy associated with demographic changes and successive global crises has been putting pressure on cities to become increasingly sustainable and resilient, using their resources intelligently and promoting the well-being of citizens. In an environment of continuous change with substantial economic, environmental, social, and infrastructure impacts, those responsible for defining resilience advancement initiatives - Smart City Chief Resilience Officers (SCROs) - need to develop complex competencies (knowledge, skills, and attitudes) and constantly adjust them to the new challenges that cities face.

The resilience of cities often requires the collaboration of diverse partners in innovation initiatives, including companies, NGOs, civic organizations, city government and others, in an innovation ecosystem configuration. The orchestration of initiatives in these ecosystems requires the city to acquire capabilities to sense, seize, and reconfigure resilience innovation opportunities in the economic, social, environmental, and infrastructure areas. The expansion of the lens of dynamic capabilities to include the notion of an urban organization with dynamic capabilities for resilience allows the assessment of the city's ability to integrate, build, and reconfigure internal and external competencies to address its resilience challenges. The table below shows the CRISIS framework integrating the dynamic capabilities of the city with the competencies SCCROs must have to contribute effectively leverage the resilience of smart cities.

Smart City (SC) Dynamic Capabilities for Resilience	Sensing	Situational awareness	Assessing and managing SC assets and services Assessing and quantifying SC risks Improving SC Resilience using tools Learning SC enabling technologies
		Opportunity screening	Planning for an SC resilience Identifying risks in an SC
		Partnership Scouting	Decision-Making and Problem-Solving Managing SC stakeholders and developing citizen networks
	Seizing	Stability and security	Crisis management SC security and safety establishment
		Continuity of Critical Services	Monitoring and controlling SC
		Effective Leadership and Management	Organizing the SC for resilience using agile principles Data analytics for SC decision making
	Reconfiguring	Adaptation and flexibility	SC urban planning and critical city's infrastructures Developing blue-green infrastructures in SC
		Regeneration	Geoservices and Digital Twins of SC Transforming cities through digital innovation
		Prevention	Using SC standards for resilience Establishing financial programs for resilience development and disaster recovery Managing the transformation to a resilient SC