

Strategic considerations of Industry 4.0 on electronic warfare using technology roadmaps

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Abstract:

The Fourth Industrial Revolution or Industry 4.0 is an ongoing industrial revolution brought about by several emerging technologies expected to disrupt most business sectors. The effect of Industry 4.0 on the Electronic Warfare (EW) sector is strategically analyzed using Technology Road Mapping (TRM). An enhanced TRM is proposed based on the fast-start TRM method that incorporates an additional military capability layer to assess the linkage between market trends and products. The enhanced TRM is applied to analyze trends, capability, product, technology, research, and resources. The TRM-based strategic analysis reveals that Industry 4.0 will create both market pull and technology push driving the required characteristics of future EW Products. The market pull effects will drive future EW products to operate in a battlespace supporting Multi-Domain Operations (MDO) and Decision Centric Warfare (DCW). Industry 4.0 will drive commercial demand for spectrum resulting in contested, congested, and shared spectrum. Advances in smart industries will facilitate prototype warfare and the Internet of Military Things (IoMT), increasing ad-hoc bespoke non-traditional threats. Traditional threats will support DCW supported by several unmanned platform concepts. Technology push effects will advance key technologies that will shape future EW products such as Artificial Intelligence (A.I), Cyber-Physical Systems (CPS), Internet of Things (IoT), and Heterogeneous Processing. Finally, we conclude that the emergent properties of future EW products will be cognitive, distributed, networked, coordinated, multi-spectral, reduced size, weight, and power (SWAP), and modular using open architectures.