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Artificial Intelligence: Obstacles Patterns and Implications

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Abstract : Artificial intelligence (AI) is a general-purpose technology that is transforming many industries, working life and society by stimulating economic growth and innovation. Despite the huge potential of benefits to be generated, the adoption of AI varies from one organization to another, from one region to another, and from one industry to another, due in part to obstacles that can inhibit an organization or organizations located in a specific geographic region or operating in a specific industry from adopting AI technology. In this context, these obstacles and their implications for AI adoption from the perspective of configurational theory is important for at least three reasons: (1) understanding these obstacles is the first step in enabling policymakers and providers to make an informed decision in stimulating AI adoption (2) most studies have investigating obstacles or challenges of AI adoption in isolation with linear assumptions while configurational theory offers a holistic and multifaceted way of investigating the intricate interactions between perceived obstacles and barriers helping to assess their synergetic combination while holding assumptions of non-linearity leading to insights that would otherwise be out of the scope of studies investigating these obstacles in isolation. This study aims to pursue two objectives: (1) characterize organizations by uncovering the typical profiles of combinations of 15 internal and external obstacles that may prevent organizations from adopting AI technology, (2) assess the variation in terms of intensity of AI adoption associated with each configuration. We used data from a survey of AI adoption by organizations conducted throughout the EU27, Norway, Iceland and the UK (N=7549). Cluster analysis and discriminant analysis help uncover configurations of organizations based on the 15 obstacles, including eight external and seven internal. Second, we compared the clusters according to AI adoption intensity using an analysis of variance (ANOVA) and a Tamhane T2 post hoc test. The study uncovers three strongly separated clusters of organizations based on perceived obstacles to AI adoption. The clusters are labeled according to their magnitude of perceived obstacles to AI adoption: (1) Cluster I – High Level of perceived obstacles (N = 2449, 32.4%)(2) Cluster II – Low Level of perceived obstacles (N =1879, 24.9%) (3) Cluster III – Moderate Level of perceived obstacles (N =3221, 42.7%). The proposed taxonomy goes beyond the normative understanding of perceived obstacles to AI adoption and associated implications: it provides a well-structured and parsimonious lens that is useful for policymakers, AI technology providers, and researchers. Surprisingly, the ANOVAs revealed a “high level of perceived obstacles” cluster associated with a significantly high intensity of AI adoption.

Keywords : Artificial intelligence (AI), obstacles, adoption, taxonomy.
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