

Digital Transformation and Socioeconomic Inequality in the European Union: A Comparative Index-Based Analysis with Policy Implications

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Abstract:

Recent innovation management literature highlights digitalization as a key driver of socioeconomic change (Appio, F. P., Frattini et al., 2021), though its effects on inequality and territorial divides are still debated (Haefner, L. C Sternberg, R., 2020). This study analyzes digitalization trends across the European Union (EU) and their links to socioeconomic inequality. Building on the Digital Economy and Society Index (DESI), it introduces a revised composite indicator to improve comparability and reliability among countries. In doing so, the research contributes to current debates on how digital development may promote or impede inclusive and sustainable growth, a core concern in innovation management (George, G., McGahan et al., 2012).

The study aims to: (i) offer an updated, comparable measure of digitalization across EU countries; (ii) analyze its relationship with socioeconomic inequality (education, poverty, marginalization); (iii) add a sub-national focus via a case study on Italian regions; (iv) provide practical insights for policymakers and managers to foster cohesion and reduce disparities.

Literature sees digital technologies as drivers of growth and inclusion but also as potential sources of greater inequality (Yu, B., Ndumu, A., Mon, L. M., et al., 2018). This study extends previous work by adding territorial and temporal analysis, and by overcoming methodological limits of current indices.

The methodological approach involves constructing a revised composite digitalization indicator, drawing from and critically reviewing the DESI and Eurostat datasets. The revised index aggregates percentage-based indicators into a synthetic score that improves measurement consistency and facilitates longitudinal analysis, with particular emphasis on progress towards the EU Digital Decade 2030 targets. An analog indicator is developed at the Italian regional level, enabling an intra-country comparison and assessment of internal territorial gaps.

Data analysis employs a mixed-methods design. The core inferential analysis investigates the link through years between digitalization and socioeconomic inequality, exploiting longitudinal econometric models. Multiple regression techniques are applied to test the extent to which education levels, poverty rates and marginalization indices are associated with different digitalization outcomes, controlling for key economic and demographic variables.

Findings reveal significant heterogeneity in digitalization advancements among EU countries and across Italian regions, with persistent gaps linked to education and deprivation indicators. These results suggest that, while digitalization can act as an equalizing force under certain conditions, it also risks intensifying inequalities where enabling factors are lacking.