Make, Buy, or Re-design

The impact of digital technologies on the organization of production

Thursday, 30 January 2020, 2 PM

Seminar Room, Department of Economics and Management, Via Inama 5, Trento.

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Abstract

The theory of the firm has traditionally focused on the choice between producing inputs in-house (the make option) or going to the market and buying them from an independent supplier (the buy option). However, the technologies which characterize the 4th industrial revolution may offer unprecedented possibilities of fast and radical re-design of products in such a way as to deeply modify the number of parts and components and the interdependencies among them. For instance, General Electric used 3D printing technology to re-design core components of its jet engine: the catalyst went down from 855 components to 12. Thus, a third option seems to appear: re-designing the product in such a way that the component is no longer needed or that the interdependencies among components are radically modified. In this paper we propose a computational model, which studies the organizational implications of a plastic product architecture that firm can strategically modify.