

The Digital Revolution in Innovation and Entrepreneurship – introduction of a conceptual framework for the impact of artificial intelligence on innovation and entrepreneurship

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Artificial Intelligence is an emerging technology with an immense transformative potential. Before this background, we discuss how artificial intelligence is transforming innovation and entrepreneurship in different ways. We develop a conceptual framework where we argue for two different roles of AI: as an originator, and as a facilitator. We outline applications and implications for innovation and entrepreneurship. Finally, we discuss future research directions in these fields.

Artificial Intelligence, Emerging Technology, Innovation, Entrepreneurship

These days nobody would doubt anymore that Artificial Intelligence (AI) will become a key technology of the 21st century. A simple search in Google Scholar gives already more than three million results, which underlines the growing research interest in this subject. Hence, it is not surprising that AI companies are in the focus of investors worldwide. In particular, AI related startups attracted over \$40 billion in 2019¹ globally already. It is not surprising that during the last decade, both private and government-lead programs have exponentially increased their investments in this technology. The generative and mutable characteristics of AI has enabled the rapid identification of potential applications by entrepreneurs and innovators alike. While the hype around the technology is not new (Meinhart, 1966)², it is now that digitization is increasingly driving these potentials into a new dimension in digital transformation (Lichtenthaler, 2020).

Beyond the exciting development of AI as a technology, the question that remains open is how AI will transform entrepreneurship and innovation at different levels. Recent contributions by scholars suggest that it has the potential to change how entrepreneurs make decisions (Townsend and Hunt, 2019), how we generate ideas and design new products and services (Kakatkar, Bilgram and Füller, 2020; Verganti, Vendraminelli and Iansiti, 2020), or how we engage with users leveraging available data (Gregory *et al.*, 2020) among others. We would like to propose to organize this prior findings in relation to the entrepreneurship and innovation processes (Brem, 2011), identifying how potential applications of AI technology resonate with the specific challenges of entrepreneurs and innovators.

Within our conceptual framework we argue that there are two different enabling functions of the AI technology, and that they matter (in different ways) how we explore the impact of the technology in

¹ <https://www.brookings.edu/techstream/what-investment-trends-reveal-about-the-global-ai-landscape/>

² E.g., Boden et al. (1998) discuss already the potential of AI in the context of creativity.

innovation and entrepreneurship. They are the originator and facilitator functions. The originator function builds upon the AI as mitigator of perceived uncertainty, reducing the perceived complexity that the decision-maker faces. It powers the capacity of an individual to explore a massive array of possible solutions and provides certainty in unknown contexts (Townsend and Hunt, 2019). This function combines the generative and creative potential of AI, going beyond Machine Learning (ML) capabilities, to explore its intelligent sensing capabilities. As a result, this function is particularly fitting in the early stages of the entrepreneurial process, where the entrepreneur struggles to find possible solutions to identified problems, or is lost in the search for the product-market fit.

The facilitator function builds instead on the enabling capacity of AI to integrate and combine data in new ways. Much of this function relies on the ML advances that we have seen in the last years (Dinov, 2018). The facilitator function relies on the ability of using AI to learn about opportunities to improve the processes that drive innovation (Balasubramanian, Ye and Xu, 2020) also in known corporate structures like the well-known Stage Gate process (Cooper, 2014). Instead of creating a new organization or new business model, the facilitator function e.g. helps to redesign how we identify and interact with lead users (Brem and Bilgram 2015; Kakatkar, Bilgram and Füller, 2020), or helps us to learn about what changes should we introduce in our services to make them more successful (Verganti, Vendraminelli and Iansiti, 2020). This function thrives with data, so the more data we can access the more valuable will be the application of AI. The rapid growth and expansion of the tech giants has provided sustained evidence on how data becomes the fuel that drives the facilitator function (Gregory *et al.*, 2020).

While most of the attention will remain on how much funds AI startups are raising³, we would like to encourage with this framework also further research to look beyond the surface. There are multiple opportunities to find approaches to understand how entrepreneurs and innovators are leveraging the power of the technology to transform how new ventures are created and innovative organizations are managed.

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