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Commercializing Deep Tech: How to Navigate the Technology-first Approach When Markets are Unknown

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Deep tech startups seek to solve the most complex and daunting challenges of our time by leveraging powerful technologies such as biotech, quantum computing, nanotechnology, or artificial intelligence (AI) (Harlé et al. 2017). Being research-intensive, requiring enormous efforts in basic research as well as large sums of investment, they are very different from conventional "shallow startups". They entail a high degree of risk, as it can take years for solutions to reach the market - if ever - and the commercial potential is not always clear from the outset (Yang et al. 2022). Therefore, both academics and practitioners are looking at unresolved issues and inherent deep tech paradoxes that emerged at last year's *ICIS 2021 panel discussion workshop* on deep tech (Pujol Priego et al. 2021). For example, given their technology-first approach, little is known about how deep tech startups deal with the unfolding paradox of (early) market validation during the lengthy technology development process and how they may navigate the deliberate search for serendipitous applications beyond their core market. In this TREO Talk paper, we shed light on this gap. To this end, we draw on preliminary insights from our ongoing collaboration with BoneXpert, a Danish deep tech startup that has been developing an AI algorithm for seven years, enabling automated determination of the skeletal maturity of a child as a basis for anabolic hormone therapy. Today, the company is a leading company in this niche, equipping radiology departments around the globe with their software. In addition, the company has discovered yet another application for its technology in sports talent search, for example, to measure the physical development potential of young athletes. By conducting in-depth interviews with various decision-makers and leaders in the company (e.g., CEO, CTO, Software engineers), we shed light on the journey and key turning points of BoneXpert since its inception in 2004. This allows us to spotlight the (1) key factors that enabled BoneXpert to develop its product over a long time, validate its commercial potential, and eventually become profitable. Moreover, we show (2) how the company has leveraged a deliberate search for serendipitous applications to discover the potential of its technology in sports talent scouting. These preliminary findings provide initial answers to some of the most pressing questions in deep tech venturing and can guide future research endeavors.

References

Harlé, N., Soussan, P., and de la Tour, A. 2017. "What deep-tech startups want from corporate partners," *The Boston Consulting Group & Hello Tomorrow.*

Pisano, G. 2006. "Can science be a business? Lessons from Biotech," *Harvard Business Review* (10), pp. 1-12.

Pujol Priego, L., Wareham, J., Romasanta, A., and Rothe, H. 2021. "Deep Tech: Emerging opportunities in innovation and entrepreneurship," in *Proceedings of the 42nd International Conference on Information Systems*, Austin, TX.