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FROM IT BUZZ TO STARTUP BUCKS: FOUNDATIONS OF TECHNOLOGICAL HYPE MANAGEMENT

TREO Paper

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Abstract

Grounded in neoinstitutional theory and building on IT fashions, this research aims to lay the foundation to understand the complex socio-technological phenomenon of technological hype, focusing on its impact on the success of startup funding pitches. By examining 7,521 equity-based crowdfunding campaigns through advanced natural language processing techniques and regression analysis, we investigate how the use of tech buzzwords and the underlying degree of technological hype influence investor decisions. Our paper builds the foundation for managing technological hype, opens new avenues for information systems research and provides practical insights for entrepreneurs, investors, and policymakers in the age of digital transformation.

Keywords: Technological Hype Management, Startup Funding, Machine Learning.

1 Motivation

Artificial intelligence, blockchain or quantum computing – when we read or hear about such IT technologies, these terms trigger something in us, even if we usually do not understand the underlying technology in detail. These vogueish, important-sounding, technological catch-all terms are also known as buzzwords (Merriam-Webster, 2024). In the age of digital transformation, attention, excitement, and expectations for emerging IT technologies are on the rise, which often leads to them being described as hyped. Drawing on the definition of hype by Logue and Grimes (2022, p. 9), which is grounded in existing research on the sociology of expectations and imagined futures, we define technological hype as “a collective vision and promise for the future of a technology around which attention, excitement, and expectations increase over time”. In this context, we see technology (tech) buzzwords as tools to activate and leverage technological hype.

Technological hype influences global political decisions (Polyviou and Zamani, 2023), the worldwide flow of funds and the direction of information systems (IS) research (Baskerville and Myers, 2009). The investigation of technological hype as an overarching socio-technological phenomenon is therefore, from our perspective, a very valuable and largely unexplored piece of the puzzle for IS research.

Following the perspective of Schumpeter (1934), the emergence of new technologies is exploited by entrepreneurs as “economic agents” of change, at an early stage of development, to capture entrepreneurial opportunities. Startups thus act as catalysts for the introduction and diffusion of promising technologies and are therefore a central component of technological innovations and the technological hype that is inextricably linked to them. Due to a lack of resources and reputation, new ventures often struggle to establish themselves in saturated markets (Stinchcombe, 1965). Therefore, they typically take risks and use innovative technologies to assert themselves and generate growth. To effectively communicate these technologies and attract investors, the wise use of tech buzzwords and

the technological hype surrounding them as a cultural resource could potentially serve as an effective management strategy for entrepreneurs (Logue and Grimes, 2022). Thus, the funding process of new ventures can be seen as a fertile ground for exploring the role and manageability of technological hype as a cultural resource and integral part of the technological innovation process.

In the field of IS, there exists a stream that explores the effects of hyped IT implementation and investment announcements on stock market investment decisions in the context of already established exchange-listed stock companies. However, the focus is not on the overarching phenomenon of hype, but locally on the characteristics of the respective technology. Furthermore, we see mixed results on the impact of IT announcements. Some research shows clear positive abnormal returns (Son et al., 2014; Subramani and Walden, 2001) and others no significant to significantly negative returns (Dewan and Fei Ren, 2007; Dos Santos et al., 1993). This discrepancy suggests that the mixed results may stem from an incomplete perspective that is primarily focused on the characteristics of a certain technology following economic-rationalist assumptions that do not take social causal forces into account and thus pushes the larger, holistic phenomenon of technological hype to the sidelines (Fichman, 2004).

By investigating how the use of tech buzzwords affects the success of funding pitches, and thereby shedding light on how technological hype as an overarching socio-technological phenomenon influences stakeholder perceptions and decision-making, we aim to make an important contribution to IS research and develop new fundamental insights into the broader understanding of the interplay between technology, society, and the economy.

We therefore aim to answer the guiding research question: ***“How does the use of hyped technology buzzwords during a startup pitch affect the investment decision of investors?”***

2 Theoretical Foundation

Our study is based on the assumptions of the theory of management fashion, which is also the foundation of IT fashion research, one of the theories that touches the phenomenon of technological hype (Fichman, 2004; Wang, 2010). The management fashion theory follows Meyer and Rowan's (1977) variant of neoinstitutional theory and emphasizes societal legitimacy over techno-economic efficiency as the primary goal in the institutional context (Abrahamson, 1996). Therefore, the theory goes beyond a purely rationalistic, independent approach and questions the assumption of the dominant paradigms that the diffusion of technological innovations is primarily based on technical efficiency (Fichman, 2004). IT fashion is defined “as a transitory collective belief that an information technology is new, efficient, and at the forefront of practice.” (Wang, 2010, p. 64), thus focusing on technologies that are considered fashionable according to the present transitory collective belief. A comparison of the definitions indicates that while hype and fashion are closely intertwined, we see a more holistic character of the inherent perspective of hype: IT Fashion is about the current collective belief in the newness and efficiency of a technology, while hype encompasses the anticipation of the future of a technology regardless of whether it is already widely used or even seen as feasible at the current point in time. Quantum computing, as one example of an emerging technology, only partial feasible and not yet widely used, shows that startups can leverage the hype surrounding a technology long before it is seen as fashionable. Therefore, while existing IT fashion literature has paved the way with its robust theoretical foundation for our work, as it provides valuable insights to the particular effects of fashionable IT, our approach seeks to build upon and extend this perspective by examining the dynamic nature of technological hype through a more nuanced perspective. We aim to examine how perceptions and behaviors of stakeholders shift over time in response to varying degrees of technological hype, with an extended focus beyond technologies that are currently already seen as fashionable.

3 Methodology

Based on our theoretical foundation, we are pursuing a comprehensive quantitative analysis in the context of equity-based crowdfunding, thus enabling us to test on a large-scale real-world dataset whether the use of hyped tech buzzwords influences the funding pitch success of new ventures. In a first

step, we therefore download the submission documents of all 6,792 companies included in the crowdfunding offering data set since its launch in 2016 from the database system of the U.S. Securities and Exchange Commission (SEC). This includes approximately 25,436 filed submissions, including crowdfunding offering statements and annual reports. In addition to the SEC filings, we have collected website links to 7,521 campaigns, from which we already have the fully scraped campaign texts and transcribed pitch videos of 1,456 campaigns. In a second step, we collected the tech buzzwords of all Gartner Hype Cycles for Emerging Technologies, which are often used models in practice since 1995 (Fenn and Raskino, 2008), to build a comprehensive basket of buzzwords with a total of 327 words. We then use a Python-based text processor that utilizes the Natural Language Toolkit to quantify the frequency of used tech buzzwords in the campaign texts and evaluate the hype of the individual technologies by collecting the worldwide Wikipedia pageviews via the Wikipedia Pageview statistics. As Wikipedia pageviews closely match the Google Trends patterns and at the same time provide unaggregated data for comparing technology hype in absolute terms, we consider Wikipedia pageviews to be a reliable first indicator to measure technological hype. To go one step further, we additionally measure the underlying diversity of buzzwords used via BERT, a machine-learning-based, pre-trained language model that allows us to generate word embeddings as mathematical vectors in a multidimensional space where semantically similar words are closer to each other (Devlin et al., 2019). Finally, based on the collected data, we want to run a multiple OLS regression with robust standard errors to determine the impact of frequency, diversity, and the underlying technological hype associated with each used tech buzzword on the average amount of funding per investor as our dependent variable. In exploring this angle as a first step, we lay a foundation to understand and analyze the complex and multi-layered phenomenon of technological hype and believe that this not only opens new research perspectives in the field of IS, but also provides practical insights for entrepreneurs, investors, and policymakers to better understand and navigate the dynamics of hype in the era of digital transformation.

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