

INSIDE THE LONG-TERM TRANSITION TO A NEW BASIC TECHNOLOGY – EVIDENCE FROM THE TRANSFORMATION OF AUTOMOTIVE SUPPLIERS

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ABSTRACT

In the transition to new basic technologies, it often takes a long time to achieve a new stable industry architecture with a new dominant design. Considering this background, we explore theoretically and empirically the transition of a single industry, that is, the transition of the automotive supplier industry to electromobility. Most companies in this industry are particularly capital-intensive, so the replacement of enabling technologies must be managed over a long period of time. The results show that "dynamic sensing capabilities" is the most significant factor influencing the degree of a company's transformation. We conclude that companies under uncertainty in a long-term transition to new enabling technologies should react to industry effects, such as the change to electromobility, with rapid information gathering instead of waiting for more information.

Keywords: *transformation, ambidexterity, electromobility, automotive supplier industry, decision under uncertainty*

1. INTRODUCTION

In the transition to new basic technologies, it often takes a long time to achieve a new stable industry architecture (e.g. Jacobides and MacDuffie 2013) with a new "dominant design" (e.g. Christensen et al. 1998). Therefore, the levels of velocity as well as uncertainty (e.g. O'Reilly III and Tushman 2013), complexity (e.g. Malik 2015) and ambiguity (e.g. Davis et al. 2009) are high (which is why we speak of a "VUCA world", e.g. Bennet and Lemoine 2014; Millar et al. 2018).

The replacement of the internal combustion engine technology by electromobility is an example of such a long-term industry transition (e.g. Donada and Attias 2015; Knobbe und Proff 2020). According to current forecasts (e.g. Deloitte 2020; McKinsey & Company 2020), even after decades (in 2030, nearly 20 years after the introduction of the new electric vehicles), sales in the new business with electromobility will only comprise half to three quarters of the total sales. This forecast indicates that until then, more than two-thirds of the sales will still be in the traditional (i.e. internal combustion engines) business.

Especially for established incumbent firms in capital-intensive sectors, the challenge in such a long-term transition to a new basic technology is that businesses with the new technology are often not profitable for a long period (e.g. Zarazua de Rubens et al. 2020). New start-ups or competitors from outside the industry without large fixed assets in the traditional technology ("brain supplier", Adner and Lieberman 2021) are much more profitable and valued higher on the stock exchange, which makes them even more challenging (e.g. Teece 2014; Thomas and Maine 2019).

If we look at the literature, there are many contrary explanations and few empirical studies that show the degree of a company's transformation in the studies (Li et al., 2022; Steiber and Sverker 2020; Piccinini et al. 2015). Some look at timing with regard to the transformation process (e.g. Lieberman and Montgomery 1998 and 2013; Suarez et al. 2015), explained by the Austrian school of competitive dynamics (e.g. Halebian et al. 2012) with an early or a late decision to react (e.g. Utterback 1994, 2000