

Sammanfattning för Olle Jonson-priset

Artificial Intelligence: From Data to Insights

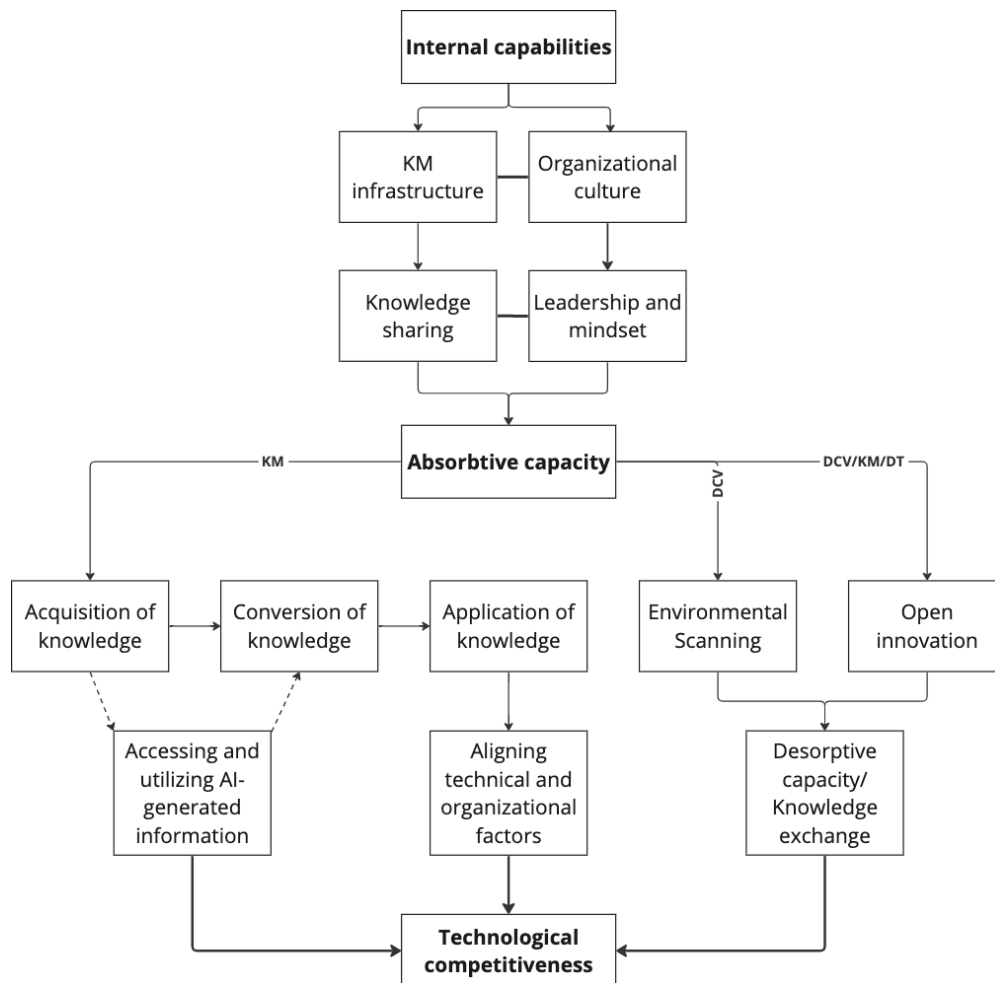
Artificial Intelligence in Digital Transformation Strategies in the Semiconductor Industry

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Emerging technologies are reshaping the digital landscape and competitive environment of highly technological companies with the introduction of artificial intelligence (AI). Firms are reacting by implementing digital transformation (DT) strategies aligning the organizational and technological factors towards leveraging AI-generated information. This thesis sheds new light on the topics of knowledge management (KM), DT, and AI in organizational practices with an emphasis on AI-enhanced software-as-a-service (SaaS). The research results in a conceptual framework, designed from the literature on AI, DT, KM, and dynamic capability view (DCV) uncovering three overarching concepts (internal capabilities, absorptive capacity, and technological competitiveness). This conceptual framework was then complemented by empirical data featuring primary data gathered from a single case study and secondary data from an internet-mediated data collection. The interviews in the case study were focused on managers with extensive experience in the semiconductor industry and operators working with the AI-enhanced SaaS tool. The analysis concludes in an updated conceptual framework, highlighting the interplay of a firm's internal capabilities and an AI-enhanced absorptive capacity indicating three pathways toward achieving technological competitiveness in a highly technological environment. Additionally, a proposed solution is presented featuring an AI-enhanced tool operator as a new role, responsible for supporting organization-wide activities with AI-generated information.

The updated conceptual framework features implementations of the empirical data. These are aimed at clarifying the relationships between the variables in the internal capabilities and absorptive capacity. Furthermore, it results in laying the foundation for achieving technological competitiveness with the expansion of the absorptive capacity. Internal capabilities now feature the relationship between KM infrastructure & organizational culture

and knowledge sharing & leadership and the mindset of employees. The absorptive capacity now includes AI-generated information as complementary to the acquisition and conversion of knowledge. Moreover, environmental scanning and open innovation were identified as initial steps to facilitate the desorptive capacity and knowledge exchange in successful partnerships and collaborations. These factors then coincide in contributing to achieving technological competitiveness in a rapidly changing environment.



By creating a conceptual framework based on the theoretical concepts of DT, KM, and DCV, the authors chose a new approach to investigate AI in an organizational context. Considering both primary and secondary data in a single-case study, the theoretical concepts were proven and compared to the current organizational practices.

Firstly, concrete theoretical contributions complementing the research gaps are new insights into the hindering and supportive internal and external factors of an organization (Kim and Kim, 2022, Kraus et al., 2022). This thesis shed light on these factors and uncovered that time

resources and pressure on other tasks are limiting the capacity to try and explore new technological solutions that would help to design processes and working routines more effectively - a vicious circle hindering innovation. This circle can only be broken by strategic managerial decisions and behavior (Kraus et al., 2022). Darmawan et al. (2023) highlight the need for further research on the role of culture, structure, leadership, and technology to improve KM capabilities. This thesis underlined the importance of innovation and the value of data for companies in the semiconductor industry to remain competitive. The establishment of a new position in the management board focusing on DT indicated a high priority of the topic within strategic decision-making and the organizational culture. This indicates a will to embrace the requirements of DT and is in line with the employees' attitude towards innovation and emerging technologies.

Secondly, the fear of being replaced or tasks becoming obsolete was not a hindering factor. AI was rather seen as a complementary and supportive technology, to avoid manual work and create more capacity for strategic and creative tasks. This provides insights into the human implications, including requirements for new employee skills and organizational processes & structures of applying black-box models when adopting AI in DT (Sestino and De Mauro, , 2021). Moreover, this thesis addresses the gap presented by Kim and Kim (2022) and provides insights based on empirical data addressing the benefits derived from utilizing AI-enhanced decision-making.

Lastly, network collaborations and partnerships are recognized as a key information source for the interviewees where knowledge exchange is the gateway to market forecasts and first-hand knowledge. This resonates with Hock-Doepgen et al's. (2021) suggestion of considering network collaborations and partnerships as a vital information stream in external KM practices.