

Literature Analysis About the Impact of the CDO on Company Success

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Abstract. The purpose of this article is to identify a potential influence of a Chief Digital Officer (CDO) on company's success. To do so, the CDO position is analyzed and put in context with existing research regarding upper echelons and consequences of digital activities. The research approach is theoretical and analytical and provides an intensive literature analysis concerning the connecting topics. Firstly, general facts and characteristics of CDOs will be presented. Secondly, the monetary influence of digital activities in former studies will be examined. Thirdly, upper echelon theory and attention-based view theory will be discussed with regard to organizational issues. In a final step, the topics mentioned are put into context with each other. The aim is to prove that the employment of a CDO might be able to influence the financial outcome of a company. As an intermediate finding it can be stated that the CDO Position has an impact on company's success. But further research is needed to clearly prove the extent of influence.

Keywords: Chief Digital Officer (CDO), Upper Echelon, Digital Transformation, Artificial Intelligence (AI)

Introduction

In 2009 the American company Starbucks got into trouble, because there was a significant slump in performance. As a result, the share price was cut in half. Thus, the management had to react. One of the actions was to hire Adam Brotman as Chief Digital Officer (CDO). Thereafter he significantly contributed to the recovering of the share price of Starbucks from \$8 in 2009 to \$73 in 2013, by initiating digital services like WIFI usage offers and mobile payment methods (Fitzgerald et al, 2014). Like Starbucks, many companies from different businesses, initiated activities to utilize new digital technologies (Singh et al, 2019). This depends on the industry. Diagram 1 (own graph) shows the number of German AI-Start-ups in 2020 by sector, which focus their business model exclusively on this digital technology (Bundesverband Deutsche Startups, 2020).

Diagram 1



Diagram 2 (own graph) describes the types of applied digital technologies by comparing SMEs and big companies on a global level (Adobe, 2019).

Diagram 2



In most cases, using such technologies is the starting point of the digital transformation of the business model (Matt et al, 2015; Singh et al, 2019). The digital transformation means the purposive application of digital technologies to optimize processes (Hofbauer et al, 2019). This can both affect existing businesses and can lead to completely new ones, like platform businesses, driven by transaction costs and network effects (Maier & Hofbauer, 2019). Neither the Chief Executive Officer (CEO) nor the Chief Information Officer (CIO) will be able to handle and manage the additional complexity of digitization. The positions of CDOs are developing and they strive to increase value added through digital technologies. This is a clear signal to attach strategic importance to this position (Tumbas et al, 2017). The number of CDO positions is doubling every year and is one of the fastest growing positions (Singh & Hess, 2017). Nevertheless, it is astonishing that a specific research about CDOs does not exist. There are merely case studies, which focus on a small and unrepresentative number of companies and non-financial issues like organizational classification and job description (Horlacher & Hess, 2016; Singh & Hess, 2017). In this context, the question arises about the financial impact of the implementation of the position of a CDO and how the CDO can contribute to the performance and profitability of the company. This can be specified in the following working thesis: *The CDO as a member of the Top Management Team (TMT) has a significant impact on company's success.*

In order to execute research on this subject, the tasks and functions of a CDO have to be analyzed first. Second, whether there have been installed digital applications before and how was their impact on success. In addition to that the impact of board members on organizations in general has to be verified.

Results

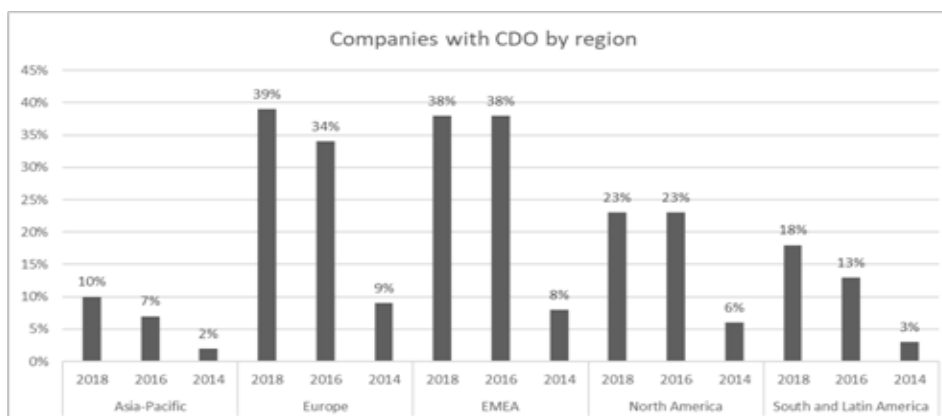
With regard to the working hypothesis, intensive literature research in various scientific journals regarding economics, management and social sciences and gradual synthesis of findings will provide results to answer to the question of research.

The role of the CDO as a new member in the TMT

As a first result of the literature research, it can be stated that the CDO represents a top management position, which came up in the years after 2000. As a member of the TMT, he poses an upper echelon and directly reports to the CEO (Singh & Hess, 2017). Regarding distribution, CDOs

can mainly be found in Europe, the Middle East and North America, while their rising number has begun to stagnate in recent times. Diagram 3 (own graph) shows the number of companies with CDOs by region (PwC Strategy&., 2019).

Diagram 3



The main task of a CDO is to develop and implement strategies of digital transformation in collaboration with the other members of the TMT. The purpose is the digital transformation of the entire company and to enhance the competitive position (Singh & Hess, 2017).

The position of the CDO is relatively emergent and can be considered as a promotor of innovations by means of digital technologies. The term CDO has not yet developed to an institutionalized professional job title, which is defined by a specific job description (Tumbas et al, 2018). This is why the competencies as well as the responsibilities of a CDO can vary greatly from one another. The activities of the CDO may be directed towards internal processes with regard to digital transformation or towards product and service innovation. But it is to be noted that a common understanding about the tasks and area of responsibility is missing (Tumbas et al, 2017). This insufficient specification leads to problems within the TMT, especially when there is a CIO installed, who is traditionally in charge of new IT technologies (Haffke et al, 2016). Problems may also arise with the Chief Strategy Officer and the Chief Innovation Officer, which are also responsible for the instauration and modernization of the organization (Singh & Hess, 2017). For this reason, the relevant literature asks for a precise definition for the understanding and the specific tasks of a CDO (Matt et al, 2015). As an intermediate result it can be stated that a CDO is supposed to be a manager of change. The subject of change is the company and the medium of change is digital technology. The change is driven by the realization of projects, which are aligned in an overall digitalization strategy. In doing so, the CDO is the responsible coordinator and communicator towards IT department and management board (Tahvanainen & Luoma, 2018). The entire business model of the company is affected by the change. The CDO guides the digital disruption and he is responsible for the generation and implementation of a holistic strategy of digitalization (Walchshofer & Riedl, 2017). In line with this strategy the CDO accelerates proactively the technological development of the company and he does not only react on changing environment (Horlacher & Hess, 2016). To get a first step towards the verification of the thesis, a sample of 100 randomly selected S&P 500 companies was built and analyzed regarding CDO presence and ROA (return on assets) development between 2015 and 2019. As shown in table 1, only the increasing number of CDOs can be verified by its positive correlation to progression of time (own calculation).

Table 1

	Year	CDO	ROA
Year	1	0.14***	0.03
CDO	0.14***	1	-0.03
ROA	0.03	-0.03	1
*p<0.1; **p<0.05; ***p<0.01			

Impact of digital activities on company’s success

This part reflects the results of the literature research about the digital change and corresponding effects on company’s success. Many studies have been executed with regard to the introduction of IT technologies in the past. Some results showed a positive effect, others showed a negative effect (Brynjolfsson & Hitt, 2000). The paradox of productivity for instance implicates that the savings of new technologies are lower than the cost of those technologies. Thus, this phenomenon is in contradiction to the assumed advantage of new technologies (Brynjolfsson & Hitt, 1996). With the beginning of the 1990s and increasing experience some studies show a positive impact of new technologies (Brynjolfsson & Hitt, 2000). For example, Bharadwaj, Bharadwaj & Konsynski detected that IT activities increase the value of a company in the long term (1999). Brynjolfsson & Hitt in contrast found a strong positive correlation between IT investment and company’s performance (1996).

Chen & Srinivasan examined the effects of application of digital strategies on performance and value of companies, which had not been oriented towards digital technologies before (2019). The underlying thesis was that digital technologies are supposed to provide a productivity gain and thus lead to a higher value of the company (Chen & Srinivasan, 2019). As a result, digital oriented companies are valued higher than the non-digital acting reference group (Chen & Srinivasan, 2019). On the one side, digital activities show a weak negative impact on company’s performance indicated by return on assets, especially in the first year (Chen & Srinivasan, 2019). On the other side, the company’s value increases, because investments in new technologies are valued positively.

Another study deals with growing data volume and big data. This study identifies that investment in big data tools induces to a higher performance (Tambe, 2014). According to Anwer, Kahn and Shah, this is based on personal and technological capabilities in dealing with data. The positive correlation between big data skills, financial performance and competitive advantage can be found in table 2 (Anwer, Kahn & Shah, 2018).

Table 2

	Big Data Technological Capabilities	Big Data Personal Capabilities	Competitive Advantage	Financial Performance
Big Data Technological Capabilities	-			
Big Data Personal Capabilities	0.23	-		
Competitive Advantage	0.28	0.35	-	
Financial Performance	0.30	0.35	0.72	-

A study in the textile industry shows that especially small and medium sized companies can benefit from applying new technologies. Cost reductions were realized in the data exchange processes with business partners (Chen et al, 2016).

So far it can be stated that the implementation of IT and digitalization tools has shown positive and negative impacts on companies. This result is not satisfying at all and leads directly to the justification of further research on this topic.

Influence of TMT members on company's success

In this section the influence of the TMT will be dealt with. In the first instance the Upper Echelon Theory (UET) will be used to answer this question (Hambrick, 2007). According to this theory companies are not only managed through reactions on external occurrences, but also through characteristics and decisions of top managers. In doing so, the decisions of the managers are based on their own perception of the situation and the perception is based on respective characteristics and experience (Hambrick, 2007). In nowadays VUCA world rational decisions are limited due to contradictory information and inconsistent purposes (Hambrick et al, 1996). Assuming that the decisions of the TMT members are essential for companies, but the perceptions might be limited, the question arises what else has an impact on company's success. The UET provides the answer in terms of the characteristics of the respective manager. The consequences of the decisions have an impact on the performance of the company (Hambrick, 2007). The literature research shows that within the framework of the UET numerous positions of the TMT have been investigated with regard to financial impact on companies. One of those studies proved that the CTO has a significant impact on ROA and that functional top managers have an influence (Medcof, 2008). By contrast, the impact of CSOs and of CMOs could not be confirmed (Menz & Scheef, 2014; Nath & Mahajan, 2008).

The theory was complemented by an overall view on the TMT including the whole set of characteristics of the TMT. As a result, it can be stated that all quality characteristics together are better qualified for projections about company's success than the characteristics on a single basis (Hambrick, 2007).

The Attention Based View theory (ABV) provides a different approach to the impact of TMT members on company's success (Ocasio, 1997). According to this theory the behavior of the company is dependent on the capability to use the perception of the top managers effectively with regard to the focused subjects (Ocasio et al, 2017). The management of the perception is an interaction of all deciders, whereas the respective persons differ according to their skills (Ocasio, 1997). On the level of a single management position the individual perception determines the awareness and interpretation of upcoming problems and generation of solutions through allocation of resources (Joseph & Wilson, 2017).

To sum up, the top manager does not only come to a single decision, but also influences the future situation of the company with his strategic behavior.

Conclusions and Recommendations

To give a résumé, it can be stated that the CDO can have an impact on company's success. CDOs are members of the TMT and are therefore upper echelons (Horlacher & Hess, 2016). Different studies about effects of digitalization strategies show that there is an impact on performance and enterprise value (Chen & Srinivasan, 2019). The CDO is responsible for the generation and implementation of digital strategies (Singh & Hess, 2017).

With regard to the UET the CDO has an impact on company's success, which is based on his characteristics and decisions (Hambrick, 2007). As a member of the TMT he also has an influence on the composition of characters. This effect has a more powerful impact on success than the personal characteristics (Hambrick, 2007; Hambrick et al, 1996).

According to the ABV the perception of CDO is crucial for the behavior of the company (Ocasio et al, 2017). This means that the CDO directs the organization towards digitalization (Ocasio, 1997).

Combining these phenomena, it can be stated that the CDO has an impact on the organization and company's success. The CDO directs the transformation process, which changes the character of the company and the character of the TMT as well.

With reference to the extensive literature research and aforementioned phenomena, the initially formulated thesis can be confirmed. This means that the CDO has an impact on company's success. But it is not clear in general, whether it is significantly positive or negative. Additionally, the influence of the degree of digitalization remains unclear.

Further research on the impact of CDOs should give an answer to these open issues and should verify quantitatively in dependence of the industry.

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