ОБЩЕСТВЕНИ КОМУНИКАЦИИ И ИНФОРМАЦИОННИ НАУКИ
PUBLIC COMMUNICATIONS AND INFORMATION SCIENCES

WHAT IMPACT DOES DIGITAL TRANSFORMATION HAVE ON BUSINESS PERFORMANCE?

Christian Funk
University of Library Studies and Information Technologies
https://doi.org/10.70300/WXKM2066

Abstract: *This article examines the impact of digital transformation on business success, to be more precise on the finacial performnce of businesses. Inspired by the countless publications on the topic of digital transfromation, this article aims to critically examine the largely positive statements about the impact of digital transformation on the performance of businesses. The article is based on a comparison of commercial and academic studies. The commercial studies examined were produced by well-known consulting and IT companies. Based on the review of academic literature studies from academia where choosen and analysed. Based on the results of the academic studies, the statements in regards to digital transformation are contextualized and interpreted, to provide a better understanding of the significance of the publications. In addition, some general findings on the effectiveness of digital transformation are presented. The results of this study show that certain framework conditions shall be taken into account, when discussing potential outcomes of investments in digital transformation, in order to derive positive effects from the programs and when these effects could occur.*
Keywords: *Digital Transformation; Bussines Performance; Semantic Analyses; Financial Reports*

INTRODUCTION

Current significance – Numerous publications postulate that the successful implementation of digital transformation has a positive impact on business success. In a study published in 2021, Boston Consulting found that companies that successfully implemented digital transformation had 1.8 times higher profit growth rates and approximately twice as high growth rates in enterprise value than their "non-digital" competitors.

At the same time, studies and publications by McKinsey and Harvard Business Review from 2018, 2020 and 2021 show that, depending on the study, only 16 to 58% of respondents rate their company's digital transformation as successful.

It is worth noting that smaller companies with fewer than 100 employees are 2.7 times more likely to have a successful transformation than large companies with more than 50,000 employees (Patrick Forth, 2021); (Walker, 2020) (Walker & Clemente, 2021); (Boutiére, et al., 2018).

RESEARCH METHODOLOGY

For this paper, a comprehensive research methodology incorporating both qualitative and quantitative approaches was adopted. The methodology primarily revolves around a systematic literature review to provide a holistic understanding of AI's applications, challenges, and societal implications.

A systematic literature review was conducted to identify and analyze (ideally) peer-reviewed studies, scholarly articles, and commercial web sources related to digital transformation. This involved defining specific research questions, establishing inclusion and exclusion criteria, and systematically searching electronic databases such as Google Scholar. The selection criteria for studies and data sources encompassed several key considerations:

Relevance: Studies and sources were selected based on their relevance to the research objectives and questions. The selected studies were focusing on the impact of digital maturity on financial business performance of companies. The academic studies used a similar data-based methodology.

Credibility: Emphasis was placed on peer-reviewed articles, reputable reports, and scholarly publications

from recognized institutions and experts in the definition of digital transformation.

Relevance: The selected studies where mainly created during the years 2018–2022 except Westermans publication from 2012.

RESULTS

The "commercial" view

Commercial studies are within these paper studies, created by management & IT consultancy companies. In 2012, Westerman published a major two-year study in cooperation with the consulting firm CapGemini. In this study of some 400 companies, 469 senior executives were interviewed. In addition, key financial figures from the 184 publicly traded companies were statistically analyzed. Depending on the degree of digital transformation in each company, Westermann was able to demonstrate up to 26% higher EBIT margins for companies with good transformation management (Westerman, 2012).

A 2019 study, let by Harald Proff from the consulting firm Deloitte, in collaboration with the University of Duisburg-Essen also came to positive conclusions. The study surveyed managers from 160 German companies. In order to identify industry differences within the study, the sample was expanded to include a further 785 data sets from the EU, North and South America. The seniority of the managers was described as followed *"26% of respondents were at the board/CxO level, 74% were at a level below the CxO"* (Proff, 2021).

The authors of the study conclude that there is a strong correlation between a company's digital capabilities or digitization to value creation and EBIT. The authors of the study refer to this as EBIT impact. Another finding of the study is, that *"a maximum profit effect of 10% is possible with digital processes and technologies, but up to 20% with digital offers and even up to 26 percent with digital business models"* (Proff, 2021).

At a first glance, the surveys of companies that have only carried out a few or fragmented digital transformation projects revealed a not surprising finding. Companies that have only carried out isolated pilot projects cannot report a profit effect. Conversely, this means that there must be a critical minimum level of digitalization efforts before a profit effect occurs (Proff, 2021). The obvious explanation for this is that the benefits of digitalization can only be reaped once a complete process chain has been (successfully) digitalized. Individual digital projects, which in the worst case interrupt a process chain due to media disruptions, hardly deliver any added value. In the worst case, media disruptions can even lead to the risk of quality losses in a process.

Another study by Deloitte Consulting LLP also reports positive influences on company results. In the study, 1200 managers in the USA were surveyed. Around 51% of those surveyed stated that they belonged to the management/executive board, while a further 22% categorized themselves as vice presidents and another 27% as directors. The company sizes in terms of annual turnover covered the range from $500 million to over $5 billion (Gurumurthy, 2020). The key message of the study is that companies that are already successful in their digital transformation report up to 45% more sales growth and 43% higher margins (net profit margin) compared to the industry average. The consultants from Deloitte justify these high figures in the financial indicators with advantages at the cost level and in the growth area.

In the area of costs, the companies surveyed, reported significantly reduced costs for the provision of new products or services. As well as significantly reduced costs for the acquisition of new customers. The high values of the net profit margin can be correlated with the reported cost reductions. The same applies to the rates of sales growth, which are above the industry average. A correlation between increased sales figures for new products and services and overall sales growth could also be derived from the survey results. The reported higher values of customer lifetime value, i.e. the contribution margin that a customer brings in over their entire customer lifetime, also contributes to both, margins and growth (Gurumurthy, 2020).

The results presented here are exemplary for countless other studies written by management and IT consultancies. When reviewing the numerous publications from the consulting world, it is striking that many studies paint an extremely optimistic picture of the potential associated with the correct implementation of digital transformation. In addition, data collection via surveys is very often used as a method.

Only a few of the studies published by management consultancies verify the statements about the

economic potential resulting from the surveys with "hard" data, e.g. measurable financial figures from annual reports. The Westerman study mentioned at the beginning of this paper seems to be one of these exceptions.

In addition to the lack of verification of the very positive results of the surveys, another possible weakness in the methodology of these surveys should be considered. As explained in the descriptions of the three exemplary studies, in each case, responsible decision-makers (managing directors, division heads, etc.) were interviewed, who in most cases had already been working in the organization for several years at the time of the survey and were responsible for investments in digital transformation. This constellation carries the risk of cognitive dissonance.

In 1978, Leon Festinger subsumed individual perceptions such as information, needs, knowledge, and opinions as cognitive elements under this term. When two cognitive elements contradict each other and express the opposite, cognitive dissonance occurs. From this thesis, Festinger derived the model of effortful justification. In essence, it states that people cannot retrospectively evaluate a decision they have made (in which they have invested effort) as bad (Festinger, 1957).

With regard to the managers surveyed in the studies conducted by management and IT consulting firms, a critical question must be asked: Is the positive feedback in the surveys reliable? Or did the managers surveyed give overly positive answers? With the knowledge of cognitive dissonance, it can be difficult to critically evaluate one's own decision or the support of a program in which a lot of money has been invested. Unfortunately, the questionnaires and methods used for statistical analysis in the above studies are not available for this study. Depending on how the data were collected, processed and prepared, the effects may have been taken into account and mitigated. Whether this has happened is unclear and would be the subject of a separate scientific study.

This leads to the thesis that studies by management and IT consultancies which are based purely on surveys could tend to produce too positive results.

The academic view

On the other hand, there are initial studies from the academic environment that aim to use the evaluation of "hard" data to provide information on whether companies that are well advanced in their digital transformation can achieve economic advantages compared to their competitors.

In the chosen studies, public listed companies in the respective countries were selected for the examination. The annual publicly available annual reports of the selected companies were collected for the respective study period. In the study by Lai Guo and Luying Xu, additional statistical databases were also included. The annual reports were subjected to a semantic analysis. The word frequency method was used to investigate how often key terms of the digital transformation were used and how their use changed over the period under investigation.

Subsequently, the development of key financial figures based on the annual reports and the market performance of the companies was analyzed over the course of the study period. Based on the data obtained, correlation analyses and regression analyses were carried out, to assess the influence of digital maturity (and the underlying sub-areas) on the financial performance of the companies.

These (3) studies were considered:

1.) Digital orientation, digital maturity, and digital intensity: determinants of financial success in digital transformation settings by Mina Nasiri, Minna Saunila and Juhani Ukko
2.) The Effects of Digital Transformation on Firm Performance: Evidence from China's Manufacturing Sector by Lei Guo 1 and Luying Xu
3.) Digital Maturity and Corporate Performance: The Case of the Baltic States by Yulia Eremina, Natalja Lace and Julija Bistrova

Study 1: The study by **Nasiri, Saunila and Ukko "Digital orientation, digital maturity, and digital intensity: determinants of financial success in digital transformation settings"** focuses on large companies, as the authors assume that they have the necessary financial resources to implement transformative projects at an organizational level. Three factors are examined as prerequisites for the

financial success of a company in the implementation of digital transformation.

Firstly, digital orientation; secondly, digital intensity and thirdly, digital maturity. They define digital orientation as commitment and openness to using new technologies. Here they refer to the definition of Sabai Khin und Theresa Char Fei Ho (Khin & Ho, 2019).

The authors use the term digital intensity to describe the ability of an organization to increase efficiency in its work through the use of new technologies (Westerman, et al., 2012). Due to the complexity of digital transformation, successful companies must constantly look for strategic options to achieve their corporate goals. The systematic approach and the necessary willingness of the company to continuously develop and adapt to structural changes as part of the digital transformation is referred to as digital maturity. The authors refer to the definition by Kane (Kane, et al., 2017).

The analysis included 284 companies and their official financial reports. In their study, the authors linked/compared the three dimensions mentioned above (digital orientation, digital intensity and digital maturity) and their characteristics with the net profit (net profit) and operating profit (operating result EBIT) from the financial reports for each company.

The authors concluded that digital intensity and digital orientation do not have a direct positive influence on the financial success of a company. BUT as strategic elements contribute to the level of digital maturity. The researchers were able to demonstrate a correlation between the level of digital maturity and the financial success of companies. The larger a company is, the stronger this correlation is.

The logical explanation for these results (in a nutshell) is, that neither the openness (digital orientation) to carry out digital transformation projects (which in the first step is only a declaration of intent - but not an action) nor the (possibly uncoordinated or poor, or mutually obstructive) use of digital technologies (digital intensity) provide the financial success.

Only when the focus is placed on an ongoing process to increase digital maturity, which integrates digital intensity and digital orientation, the positive effects on companies' key financial figures will arise.

Study 1 shows a correlation between the level of digital maturity and the financial success of companies (Nasiri, et al., 2022).

Study 2: The Effects of Digital Transformation on Firm Performance: Evidence from China's Manufacturing Sector by Lei Guo 1 and Luying Xu

The study examines the impact of digital transformation on the two dimensions of operational performance (cost reduction and efficiency improvement) and financial performance of companies. The study used data from 2254 manufacturing companies listed in the A-share market from 2010–2020 in China.

The researchers assume a U-shaped relationship between digital transformation and the impact on financial performance. This means that at the beginning of the digital transformation efforts and investment costs have a negative impact; after a certain point in time, a bottoming out can be seen before the positive effect of the digital transformation has a positive impact on the key financial figures. The study aims to compare the benefits of digital transformation with the costs. Furthermore, the authors argue that digital transformation has a greater and longer-lasting impact on operational performance than on financial results.

In the study, return on assets (ROA) is used as a proxy variable for financial performance, i.e. a company's annual net profit is divided by its total assets. Digital Intensity is the independent variable in this study. Digital Transformation Intensity shows the use / deployment (how much and how intense) of digital technology.

As in the previous study, digital intensity is determined by analyzing the text of the respective annual reports. The word frequency method was used. Brynjolfsson and Hitt [11] (Brynjolfsson, 1996, cited from Guo & Xu, 2021) found that IT often has a strong impact on business performance two to three years after its introduction. Since digital transformation affects operational and financial performance differently, the lag period is set to one year for operational performance and three years for financial performance. The sample periods of the independent variables were 2010–2019 and 2010–2017 respectively.

Study 2 shows a positive correlation between investments in digital transformation and a company's operational performance. The effect is seen as consistently positive up to the fifth year after the start of the activity.

Study 2 confirms the impact of digital transformation on a company's financial results. The positive impact begins with a time lag from the second year and disappears by the fifth year (Guo & Xu, 2021).

Study 3: Digital Maturity and Corporate Performance: The Case of the Baltic States by Yulia Eremina, Natalja Lace and Julija Bistrova

The research looks at listed companies in the Baltic States (Nasdaq Baltic main list). In a first step, a linguistic analysis of the annual reports of the years 2013–2018 was carried out in which the companies explain the progress of their digital transformation projects to their shareholders – in the broadest sense, what their digital maturity level is. The analysis was carried out with the help of NVIVO software.

The sample consisted of 28 companies, 13 from Estonia, 11 from Lithuania and 4 from Latvia. I

In a second step, the financial results of the companies were analyzed. The key figures were analyzed: Sales Growth; EPS growth; ROE (return earned on equity capital); Gross profit / assets; Gross profit margin; Operating Profit Margin; Net profit margin; TSR (Total shareholders Return) – set in correlation to digital maturity. The median of the correlations of the above-mentioned individual values to digital maturity shows a heterogeneous picture:

- Sales Growth / RoE / Gross Profit / Assets - *show a positive correlation*
- Gross Profit Margin / Operating Profit Margin / Net Profit Margin – *are around zero, i.e. a correlation cannot be proven*
- EPS Growth and TSR – *show a negative correlation*

The positive correlations in sales growth could be explained by looking at the period in which the analyzed data was generated (2013 to 2017) and placing this in the context of the focus topics that were implemented in IT projects during this period. Online sales, customer relationship management and online marketing have significantly optimized the sales economy at that time.

The neutral and negative correlations in the key financial figures could be due to the fact that the digital transformation was not yet sufficiently advanced at the time of data collection to raise the companies surveyed to a higher level of digital maturity overall. However, this is offset by the investment costs for the digital transformation projects.

Study 3 shows a (positive and negative) correlation between individual key financial figures and the digital maturity of a company.

CONCLUSION

Looking at the three studies presented, which were carried out using a similar methodology, but differ greatly in terms of the underlying data basis, we see:

a.) different sample sizes
b.) different times of the sample survey
c.) different geographical origin of the data
d.) and different sizes of the companies considered.

All three studies can demonstrate a correlation between the extent of the digital transformation and the financial success of the company. However, the results are not as clear and positive as those of the consulting & IT consultancy studies presented at the beginning of this paper. A more differentiated view is necessary here. While a methodological weakness was already pointed out at the beginning of this chapter in the context of the surveys of the consulting & IT firms. The academic studies are very similar in design and use a semantic analysis of the annual report to assess a company's digital progress.

This procedure is certainly a valid method for analyzing the sometimes quite large amounts of data with reasonable effort and in a reasonable amount of time. The "measurement" of digital progress in a company via additional surveys to collect "hard" data of defined KPIs could certainly provide a more reliable data basis here. Which could be an approach for future research.

The different and sometimes contradictory statements on the influence of digital progress in a company on its financial success can be explained by the following framework conditions:

a. Company size – the influence of digital transformation is more pronounced in large organizations

than in small ones. The costs for digital transformation projects have a certain minimum volume.

b. In smaller companies, the success rate of digital projects tends to be higher than in large companies
c. Progress of the digital transformation – a minimum level of digital transformation must have taken place throughout the company – the positive effects only become visible after this "break-even" point
d. Time – the positive effects of investments in digital transformation occur with a time lag. (the positive effect starts from the second year and disappears from the fifth year)

So in the end one could argue, that investments in digital Transformation are not different to other investments in e.g. production facilities or innovations. Digital transformation is not the magic wand that consulting companies promise us. It always requires a well-developed business case and solid project implementation.

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КАКВО ВЪЗДЕЙСТВИЕ ОКАЗВА ЦИФРОВАТА ТРАНСФОРМАЦИЯ ВЪРХУ ЕФЕКТИВНОСТТА НА БИЗНЕСА?

Резюме: *В тази статия се разглежда въздействието на цифровата трансформация върху успеха на бизнеса, по-точно върху финансовите резултати на предприятията. Вдъхновена от безбройните публикации по темата за цифровата трансформация, статията има за цел да подложи на критичен анализ предимно положителните твърдения за въздействието на цифровата трансформация върху резултатите на предприятията. Проучването се основава на сравнение на търговски и академични проучвания. Разгледаните комерсиални проучвания са изготвени от известни консултантски и ИТ компании. Въз основа на прегледа на академичната литература са избрани и анализирани изследвания от академичните среди. Въз основа на резултатите от академичните изследвания твърденията по отношение на цифровата трансформация са контекстуализирани и интерпретирани, за да*

се осигури по-добро разбиране на значението на публикациите. Освен това са представени някои общи констатации относно ефективността на цифровата трансформация. Резултатите от това проучване показват, че при обсъждането на потенциалните резултати от инвестициите в цифровата трансформация трябва да се вземат предвид някои рамкови условия, за да се извлекат положителни ефекти от програмите и да се установи кога могат да се проявят тези ефекти.
Ключови думи: *цифрова трансформация; ефективност на бизнеса*

Кристиан Функ, докторант
Университет по библиотекознание и информационни технологии
E-mail: chfunk@hotmail.com