# Digitalisation and Business Success

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Software investments can significantly contribute to corporate success by optimising productivity, stimulating creativity, elevating customer satisfaction, and equipping organisations with the essential resources to adapt and thrive in a rapidly changing market.

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## 1. Introduction

Digital progress is changing markets, business models, value chains and companies worldwide and across industries. Innovative concepts, newly launched start-ups, or established organisations that have been engaged in different industries appear as new challengers to conventional business methods and models. Amazon or eBay have put stationary trade under pressure, Airbnb has developed a digital business model to connect people who have unused and available accommodation with those who need temporary accommodation via digital marketplaces. Along with PayPal and Google with Android Pay, the German Fidor Bank has also entered the market for payment services with new business models and by combining its experience with digital processes and data management with banking services. The advent of new technology has spawned the development of new markets. If companies did not want to be forced out of the market, they were forced to adapt their processes to the new conditions. The literature shows that the current digitalisation process has brought a new quality of human substitution to the current process of digitalisation, since for the first time more complex activities that previously required special cognitive abilities can now be performed by machines (Bardmann 2019; Krause and Pellens 2017; Nagl et al. 2017).

Investment in intangible, knowledge-intensive assets such as research and development, software or licences is a driver of productivity growth in economically advanced countries. The main purpose of this paper is to determine whether software investments resulting from digitalisation efforts in Austrian ATX Prime market firms influence the economic success of the companies under review. The findings of the qualitative content analysis indicate that organisations operating within the finance industry engage in a significant amount of digitalisation initiatives. Consequently, an examination was conducted again to assess the impact of digitalisation on economic performance, with a specific focus on the finance and non-finance sectors.

There is a limited body of research that investigates the relationship between investments in digitalisation and the financial performance of firms. Among the several studies conducted, only a limited number of them specifically concentrate on publicly traded corporations. To ensure the accuracy of statements and computations, it is necessary to engage in comprehensive data collecting, which entails conducting a thorough examination of investments and cost structures. Gathering data and information within the framework of an employee survey conducted at companies may not be feasible, as companies typically do not disclose such information to external entities. In the context of internal corporate analysis, the acquisition of these data can be readily accomplished through financial accounting. In contrast, external analysts are limited to utilising solely the annual report and the company's official website for their information gathering purposes. The asset overview (from the annual report) can be consulted for updates to purchased software or licences for software. Software created by the business itself is subject to special regulations. Austrian corporations whose shares are officially traded on a stock exchange must prepare their consolidated financial statements in accordance with International Financial Reporting Standards (IFRS). The standard IAS 38.21 requires companies to recognise internally generated intangible assets if the asset satisfies the recognition criterion of future economic benefits and reliable measurement of production costs. This requirement applies to banks and insurance companies as well. If an internally generated intangible asset does not meet these criteria, it is considered research expenditure. Companies must disclose in the notes the amount of research and development costs recognised as expenses during the fiscal year. The consolidated annual reports of the investigated organisations provide information on the research and development expenses associated with software development or digitalisation costs.

## 2. Relationship between Digitalisation and Business Success

There are many research contributions about digitalisation but only few studies examine the relationship between digitalisation and business success. Noteworthy in this context is the 2021 study by Truant et al. (2021), which surveys the impact of digitalisation on company performance using a sample of Italian listed companies from a variety of industries. The results indicate that the adoption of digital tools to support daily company operations is still in its infancy, but the effects of digitalisation on company performance are observable. In their study, the authors cited numerous scholars (for example Benner and Ranganathan (2017); Hossnofsky and Junge (2019)) who studied the relationship between stock market valuation and the disclosure of information about digitalisation and concluded that information about digitalisation has a positive effect on the value of a company. Their inference is that digitalisation investments influence a company's stock market performance. It is expected that listed companies will have a high level of digitalisation initiatives due to the positive correlation between stock market value and digitalisation investments. The authors were, however, unable to confirm this hypothesis. Only 13% of publicly traded Italian firms have fully implemented and utilised digital tools such as business intelligence, analytics, and Big Data, while 53% of the surveyed companies have inadequate implementation; 34% of the sample lacks digital tools and advanced digital tools. The research was conducted from December 2019 to September 2020 (Truant et al. 2021).

In 2021, Broccardo et al. (2023) conducted an additional study on companies listed on the Italian stock exchange. The study focused on analysing the influence of digitalisation on the incorporation of sustainability into corporate strategy and its effect on financial performance. The study revealed a noteworthy association between digitalisation, sustainability, and profitability in publicly traded enterprises in Italy. The study emphasizes the significance of incorporating sustainability into company plans and the possible influence of digitalisation on the execution and effectiveness of sustainability (Broccardo et al. 2023).

Consistent findings are presented in an investigation conducted by Ionașcu et al. (2022). This research paper examines, within the framework of the European Green Deal, the digital transformation of publicly traded corporations in the European Union. The study's goal is to investigate the relationship between digitalisation, financial success, and sustainability. The authors used a quantitative examination of annual reports from 2018 to 2020 to generate a digitalisation index for 986 company-year data. The findings indicate a beneficial relationship between digitalisation initiatives and corporate social responsibility, notably in terms of environmental preservation. Furthermore, the research revealed a favorable correlation between digitalisation endeavors and market performance, indicating that investors place a higher value on organizations that have made significant progress in the process of digital transformation. These findings have consequences for EU regulators and the management plans of large European listed corporations.

Salvi et al. (2021) carried out a significant study that aimed to investigate how the data provided by businesses on their websites regarding their level of digitalisation affect the value of the firm. The extent of information on digitalisation was gathered by performing a manual content analysis of company websites. The regression research conducted on a sample of 114 globally operating enterprises revealed a positive correlation between the level of information regarding digitalisation and the value of the company. Control variables, including company size, return on assets, liquidity, research and development intensity, profit growth rate, unlevered beta, and financial leverage, exhibited noteworthy associations with firm value. The findings suggest that the level of digitalisation within a firm has a favourable impact on its value and emphasizes the significance of this information as a signal to investors.

A study by Chen and Srinivasan (2023), which investigates the influence of digitalisation on the value and performance of non-technology enterprises, yields intriguing findings. In order to achieve this objective, the authors devised a text-based metric to gauge digital activity, thereby generating a substantial pool of organizations that are undergoing digitalisation. The findings indicate that non-technology organizations that adopt digitalisation are typically characterized by their size and youthfulness. Furthermore, these companies tend to allocate a greater portion of their resources towards sales and operate within industries that exhibit a higher level of digital activity. Companies that adopted digital technology experienced an increase in their valuations. Specifically, their market-to-book ratios are 8% to 26% higher compared to other companies in the same industry. Nevertheless, the authors discover inconclusive findings when analysing the influence of digital activities on accounting performance metrics. The data indicate that digital activities have a positive impact on company productivity, as seen by improvements in return on assets (ROA) and asset turnover. However, the association between digital activities, profit margins, and revenue growth is either minor or negative. The authors ascribe the limited improvements in the accounting performance of digital operations to the extended durations required for the return on digital investments, competitive pressure, or the market enthusiasm linked to digitalisation. However, the authors did not conduct a further analysis to determine which of these characteristics elucidates their results.

Chinese scholars are particularly interested in the relationship between digitalisation and company financial development. In recent years, there have been a number of publications investigating the impact of the digital transformation on the financial performance of publicly traded corporations. Zeng et al. (2022) study examines the impact of the relationship between corporate digitalisation and financial performance on both business value and the process of value generation. The researchers gathered and empirically examined data from Chinese A-share listed companies spanning the period from 2012 to 2019. The findings indicate that the implementation of digital technology has a substantial favorable impact on the overall performance of a company. Additionally, the experience of the top management team has a beneficial role in enhancing the relationship between digitalisation and financial performance. This finding validates a study conducted by Ren (Ren et al. 2023) in 2023, which indicates a direct relationship between the degree of digitalisation and the level of digital awareness among managers. Additionally, the study reveals that competition within the business strengthens the benefits of digital technology, leading to financial gains. Furthermore, it is worth mentioning that the financial impact of corporate digitalisation varies across different entities. Specifically, the process of digital transformation has a more pronounced effect on the financial performance of State-Owned-Enterprises (SOE). Gao et al. (2023) reach a similar finding and ascribe this to government subsidies.

A research paper authored by Ren et al. (2023) investigates the influence of digitalisation on the performance of all Chinese enterprises that are listed. The authors collected over 40,000 data points on digital investments, including software, computer hardware, platform systems, and others, from the annual reports of corporations spanning from 2009 to 2020. These data are utilized to quantify the level of digitalisation of firms. Similar to the study presented here, the text analysis method is employed to gather the keywords associated with “digitalisation” from the annual reports of Chinese listed firms. This analysis explores the current state and factors influencing the development of digital business applications, as well as the impact of digitalisation on firm performance. The study concludes that investments in digitalisation enhance corporate performance, and there is a positive correlation between the level of digitalisation in organizations and the managers’ digital awareness.

A similar academic study, analysing the influence of digitalisation on the financial performance of Chinese publicly traded firms, draws comparable findings to Ren’s (Ren et al. 2023) research. This analysis utilizes manually collected digital company data spanning from 2012 to 2020. The study develops a metric to measure the level of digitalisation in corporations and concludes that digitalisation enhances corporate performance. The research also examines the possible mechanisms by which digitalisation impacts company performance, including the reduction of external transaction costs and the enhancement of internal control. The study employs a panel analysis to quantify the business performance outcomes that are influenced by corporate digitalisation. Furthermore, the text portion encompasses an examination of the disparity among firms, revealing that SOEs derive greater advantages from digitalisation compared to non-SOEs. This is attributed to the fact that SOEs obtain more financial resources and political backing for their digitalisation endeavours (Gao et al. 2023).

Few researchers have focused their studies on publicly traded companies, and the few studies that have been conducted provide an incomplete picture of the level of digitalisation among these companies due to a lack of empirical evidence demonstrating the effect of digitalisation on firm performance. More research contributions related to digitalisation and impact on economic success are found among small- and medium-sized enterprises (for example, studies conducted by Bouwman et al. (2018); Chesbrough (2006); Etienne Fabian et al. (2023); Giesen et al. (2010)).

Pfister and Lehmann (2022) conducted a systematic literature review to assess the effect of digitalisation on small- and medium-sized enterprises (SME) financial performance. From 2009 to 2019, 124 peer-reviewed journal articles were extracted from databases such as EBSCOhost, Emerald, ResearchGate, and ScienceDirect and analysed. The authors were able to classify 14 verified added values, ranked by number of mentions, as both financial and strategic digital advantages. Efficiency and effectiveness, cost reduction, increased productivity, customer satisfaction, and competitive advantage were the most frequently mentioned outcomes. 2022, Pfister and Lehmann (2023) conducted a qualitative study in small- and medium-sized businesses to investigate how SME managers create added value and achieve a quantifiable return on investment (ROI) using digital technologies. Based on 48 expert interviews, the authors concluded that digital solutions either increased revenue through increased sales and new business models or reduced operating and personnel costs.

In a 2015 study published by Enríquez et al. (2015), structural equation modelling (SEM) was used to analyse data from 200 manufacturing SMEs in the Mexican state of Aguascalientes. The authors concluded that the hypotheses tested suggest that information and communication technology (ICT) has a positive and significant impact on the financial performance, cost reduction, use of technology, and competitiveness of these types of companies. Surveys such as Schwer and Lucas (2022) reveal which company variables are significantly related to strong digitalisation activities and

the financial success of the company. For this purpose, the authors performed a correlation analysis on several variables. A survey conducted by the European Investment Bank provided the information for the analysis. Target variables are endogenous variables like “Implementation of Multiple Digital Technologies (IMDT)” and “Financial Business Outcomes (FBO)”. The IMDT variable indicates whether a company has implemented multiple digital technologies and thus provides information about the extent of its digitalisation efforts. Profit, loss, and break-even before taxes comprise the FBO variable. Climate, COVID-19, company profile, innovation and digitalisation, investment activity, and other company variables encompass the exogenous variables. The effect of exogenous variables on the digitalisation activities of a company and the effect of digitalisation-relevant exogenous variables on the success of the company were investigated. The study by Schwer and Lucas (2022) draws the conclusion that digitalisation is seen as a critical success activity and that successful companies have strong planning and leadership skills. These businesses frequently sell their goods and services on a global scale and have a high investment intensity (total investments divided by the number of employees).

Another notable study was undertaken by Fernández-Portillo et al. (2022), which examines the impact of innovation on the association between a company’s digitalisation efforts and its economic and financial performance exclusively for retail enterprises that are headquartered in Spain. The study investigates the causal relationship between these factors. However, it does not include any information regarding whether these companies are publicly listed. The authors reached the conclusion that the enhancement of a company’s performance is not solely contingent upon its digitalisation, but rather, it is imperative for this digitalisation to be harmonised with a well-defined innovation strategy that ultimately results in enhanced commercial performance.

The banking industry is undergoing a digital transformation that is reshaping the way financial products and services are marketed and distributed. This shift might be attributed to the increasing need for digital platforms and the advancement of emerging technology. The digital transformation in the banking industry has been instigated by the advent of new financial technology companies (Valero et al. 2020). FinTechs are a research area in management, digitalisation, and transaction costs. Howell E. Jackson’s study, “The nature of the FinTech Firm”, draws inspiration from Ronald Coase’s seminal work “The nature of the firm” to discuss the rise of financial technology (Jackson 2020). The existing body of scholarly literature pertaining to FinTechs has predominantly concentrated on their business advantages, as researchers have delved into the possibilities and merits associated with their adoption (Jinasena et al. 2020; Ruhland and Wiese 2023). There is a scarcity of research investigating the impact of digitalisation on the financial performance of FinTechs and financial institutions in general.

The research demonstrates a growing focus on the financial advantages linked to digitalisation and the underlying mechanisms supporting it. To summarize, digitalisation can yield significant advantages, but it is crucial to conduct research, particularly in quantitative terms, to provide evidence for its effectiveness. The objective of this research is to address a knowledge gap in the existing literature by examining the potential influence of digitalisation investments on the economic performance of Austrian publicly traded enterprises.

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