

Michael Faust

The Changing Relevance of Digitalization and its Consequences.

The Innovation Phase of the Internet Euphoria and the Subsequent Consolidation Phase

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Soziologisches Forschungsinstitut Göttingen (SOFI) e.V.
an der Georg-August-Universität

Zitationshinweis

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Abstract

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Ideas about future potential applications of digital technologies and their effects as well as the promises they hold for the strategic positioning of companies are necessary to turn a (still) undirected search and experimentation into innovation. Decisions under uncertainty require collectively authenticated expectations that it is sensible, desirable and promising to start a project, to align one's career with it, to promote it and to finance it. The core of the argument presented here is that imagined futures frame current decisions, both with respect to investment in technology-based innovations and to (financial) investments in firms, the valuation of which is influenced to a greater or lesser extent by technology expectations. However, what happens if the original promise of digitalization cannot be realized in the future while nevertheless all the financial resources have been mobilized in the present? The general answer to this question is that we can expect a major reassessment of physical and financial investment that may end up in a profound economic crisis. These conceptual considerations can be used to reinterpret ongoing and previous research. The paper at hand uses these conceptual considerations to analyze a former succession of an innovation phase to a consolidation phase: the Internet euphoria and its decline. Based on a secondary analysis of qualitative interviews from a former research project and other historical data covering the period from 1995 to 2005, the paper shows that the collective beliefs in the blessing of the Internet motivated both firms to invest in new technology and financial investors to direct money to Start-Ups and listed corporations that promised to profit from the new digital technology. At firm level the disappointment about the missing return on investment resulted in a consolidation phase. Now digitalization was not any more perceived as a means for competitive advantages but as a taken-for-granted and indispensable informational infrastructure that management has to "keep under control" because it is complex, vulnerable and costly.

Zusammenfassung

Die wechselnde Relevanz der Digitalisierung und ihre Konsequenzen.

Die Innovationsphase der Internet-Euphorie und die folgende Konsolidierungsphase

Vorstellungen über die zukünftig möglichen Anwendungen digitaler Technologien und ihrer Effekte und die Versprechen, die diese für die strategische Positionierung von Firmen mit sich führen, sind notwendig um ein ungerichtetes Suchen und Experimentieren in eine Innovation zu verwandeln. Entscheidungen unter Unsicherheit benötigen kollektiv beglaubigte Erwartungen, dass es vernünftig, wünschenswert und vielversprechend ist, ein neues Projekt zu beginnen, seine Karriere daran auszurichten, es zu unterstützen und zu finanzieren. Imaginierte Zukünfte rahmen gegenwärtige Entscheidungen im Hinblick auf die Investitionen in technologiebasierte Innovationen ebenso wie auf das finanzielle Engagement in Firmen, deren Bewertung mehr oder weniger stark von den Technologieerwartungen geprägt sind. Was geschieht jedoch, falls das ursprüngliche Digitalisierungsversprechen sich in der Zukunft nicht realisieren lässt, während doch eine Vielzahl finanzieller und personeller Ressourcen in der Gegenwart mobilisiert worden sind. Die generelle Antwort auf diese Frage lautet, dass wir eine bedeutende Neubewertung der physischen und finanziellen Investitionen erwarten können, die zu einer tiefen ökonomischen Krise führen können. Das vorliegende Paper nutzt diese konzeptionellen Überlegungen zur Analyse einer früheren Abfolge einer Innovations- durch eine Konsolidierungsphase: die Interneteuphorie und ihr Niedergang. Gestützt auf eine Sekundäranalyse qualitativer Interviews aus einem früheren Forschungsprojekt und anderen historischen Daten, die den Zeitraum von 1995 bis 2005 abdecken, zeigt das Paper, dass der kollektive Glaube an die Verheißungen des Internet sowohl Firmen dazu motivierte, in neue Technologien zu investieren, als auch Finanzinvestoren dazu veranlasste, Geld in Start-Ups und börsennotierte Unternehmen zu lenken, die versprachen vom Einsatz neuer digitaler Technologien zu profitieren. Auf Unternehmensebene mündete die Enttäuschung über die ausbleibenden "returns on investment" in eine Konsolidierungsphase. Nun wurde die Digitalisierung nicht mehr als ein Mittel zur Erzielung von Wettbewerbsvorteilen angesehen, sondern die IT als selbstverständliche und unhintergehbare Informationsinfrastruktur, die das Management aber unter Kontrolle halten musste, weil sie komplex, verletzlich und kostenträchtig ist.

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1 Introduction¹

Digitalization is on everyone's lips. Its protagonists praise it as a panacea for whatever purpose and like a magic word its invocation opens the access to quite some treasures that were formerly inaccessible: "Open, Sesame". Although increasingly doubts have been raised in 2022 (Faust 2023) the appearance of ChatGPT resulted in a new and even more breathless hype - this time referring to AI - stylized as an all-purpose weapon to any problem that might arise (Hirsch-Kreinsen/Krokowski 2024).²

In an academic language, digitalization is a technology promise. Widely held technology promises may enable technology-based innovations by motivating innovators, orchestrating coalitions of supporters and mobilizing finance and funding.

It is without dispute that digitalization (and specifically AI) today serve as an widely hold and impressing technology promise that leads firms and fund managers to invest in firms that promise to profit from the economy wide benefits of digital technologies, be it providers of new technologies or alleged profiteers of the application of these. However, it is still open whether or not the current expectations will be fulfilled and whether the investments that resulted from these will pay off. While we simply cannot know what will be the results we are able to know that in principle the outcomes may differ according to a variety of conditions (Buss et al. 2021). And historically (empirically) we know of former phases in which widely believed digitalization promises did not come true or only partially and resulted in great disappointment of previous believers and even in a profound economic crisis.

The second paragraph sketches our understanding of digitalization as a company-related innovation promise and of the political-cultural process by which expectations are build, validated and revised. In different phases a different meaning and relevance is assigned to digitalization. After having developed these arguments theoretically (3), we explore in more detail the impact of financialization on the dynamics of expectation building because the finance-innovation nexus is of particular importance. Financial valuation of digitalization promises is both a mirror and a driving force of the ups and downs of these promises (4). Based on this theoretical outline we turn to a historical sequence in which an innovation phase was followed by a consolidation phase of digitalization: the rise and decline of the Internet euphoria from the second half of the 1990s till roundabout the mid-2000s (5).

Regarding the historical account the paper is based on the secondary analysis of interviews with CIOs, IT consultants, computer scientist and other experts in the field of computing conducted in a former research project. The historical accounts so far can only rely on a provisional analysis of these interviews and additional findings from literature and other sources.

¹ This SOFI Working Paper is an extended and revised version of a paper originally written for the Network „Digital Economy“ at the annual SASE conference 2024 in Limerick

² We are fully aware of the fact that digitalization projects need closer specifications with respect to both technology and use case. These specifications often refer to specific fields regarding which more specific advantages are promised (e.g. Industrie 4.0, autonomous driving). Nevertheless, umbrella terms like digitalization dominate the discourse in which more general promises circulate (e.g. productivity gains). Therefore, digitalization as well as AI can be seen as „boundary objects“ (Star/Griesemer 1989) that have to be translated locally both in practice and discourse (Czarniawska/Joerges 1996; Meyer 2020). Such boundary objects have the advantage that many different actors may refer to them and thereby disguise their respective attitudes and intentions.

A historical reconstruction of this former phase of expectation building and erosion is a task in its own right. However, the paper is part of a larger endeavor in which we aim to compare the more recent innovation phase with the former. What are the commonalities and differences of the Internet bubble with the more recent disappointments regarding AI is openly and fiercely debated in the business press and among the investor community. Does the dotcom bubble come back and will the disappointments about the blessings of AI lead to similar economic results? These questions are of foremost concern for investors and managers as they invested billions of dollars based on the collective belief in the virtue of digitalization.

2 Digitalization promises and strategic reference

We are interested in the digitalization process of firms as an interplay of collective expectations and strategic positioning. To do so we can rely on a variety of theoretical approaches from science and technology studies (STS), economic sociology and the sociology of organizations (see also Meyer 2020). In all these approaches collectively shared beliefs, images, or expectations about the necessarily unknown future play a crucial role. This is true for the „Leitbild“ approach (Dierkes et al. 1992; Menez et al. 2016), for the “Sociology of Expectations in Science and Technology” (Borup u. a. 2006; Pollock/Williams 2010b), the concept of technology promises (“Technologieverprechen”) (Hirsch-Kreinsen 2023, 2016), “Sociotechnical imaginaries” (Jasanoff/Kim 2009) and “Organizing Visions” (Swanson/Ramiller 1997).³

Beckert (2016) lays claim to address a more encompassing explanation. According to him, fictional expectations are a core element of a theory of capitalism. Imagined futures orient actors with respect to all four “building blocks of capitalism” (ibid. 95ff): Money and credit, (financial) investment, innovation and consumption. This extended approach is particularly suitable for the task at hand because we are interested in the interplay of decisions regarding technologically based innovation and the strategic reference of firms (including (financial) investment) in the dynamic of capitalism (Deutschmann 2008). We do not go into the details of each of these approaches but prepare a summary of basic insights delivered by these concepts. Doing so, we do not distinguish systematically between the notions of expectations, promises, imaginations or visions. These distinctions are not relevant for the task at hand and therefore, we use them primarily synonymously. For instance, promises imply expectations and expectations become promises if its effects are positively connoted. The core group of innovators make more or less far-reaching promises to which other actors have to refer to without necessarily sharing the positive valuation (Borup et al. 2006: 268).

If we refer more narrowly to the ongoing digitalization process we use the term digitalization promise instead of technology promise. As our focus is on the strategic positioning of firms within capitalist competition, strategies are valued according to differentiation and innovativeness and not according to appropriateness and isomorphism as in neo-institutionalist organization theory (Meyer/Rowan 1977; DiMaggio/Powell 1983). Accordingly, we understand technology or digitalization promises as innovation promises. These can relate to other parameters than technology by which firms try to differentiate themselves from competitors (for instance organizational or management structure, global coverage, alliances

³ All these approaches share the same theoretical assumption that imaginations of the future matter in the present and are a prerequisite for innovation to succeed. However, they can be distinguished by the emphasis that is given to the success of (technological) innovation, the role of different actors and the level of analysis.

or structure and extension of value chains). However, appropriateness or to strive for isomorphism has not become irrelevant. Firms may not be delegitimized only because they lack the evidence of currently expected innovativeness but also because they cannot exhibit taken-for-granted structures, procedures or technologies and prove its everyday efficient command. This is also true for the everyday use of computers that may be governed by a widely shared rationalized myth (Faust/Bahn Müller 1996). How outmoded appears a public administration which relies on fax machines instead of ICT!

At the heart of concepts interested in the emergence, implementation and diffusion of technology-related innovations is the reference to the future and the associated uncertainty in the decision-making situation. Digitalization promises have two sides: a technological side and an impact side. Current digitalization promises are accompanied by the assertion that there is currently a "technological thrust" that brings with it "completely new and unknown technological *potentials*" (emphasis by the author), and that on the impact side "downright disruptive social and economic consequences" are to be expected (Hirsch-Kreinsen 2020: 12). Regarding both effects this is a promise or expectation. The expected effects can be assessed differently depending on the people affected and their values and interests. However, proponents and opponents share the assumptions about the technology's effectiveness and the inevitability of its triumph.

Despite the uncertainty in the decision-making situation, decisions must nevertheless be taken in the here and now. Collectively shared expectations or promises are the prerequisite for the implementation and dissemination of innovations. In the beginning, the innovation often has only a local meaning, but needs the horizon of the meaning of a widely shared technology promise that enables the pursued innovation projects to be enforced and disseminated. Such collectively authenticated technology promises allow uncertainty to be absorbed or temporarily suspended. They motivate the protagonists and enable them to cope with setbacks and to persevere. They orchestrate coalitions that support, fund, and promote the projects (Kowol 1998).

The local initiators may themselves be involved in the creation of such a technology promise, or they may "read" their project into an existing or developing promise. Once a technology promise has become established, additional local actors are likely to reframe their activities and assign them to the highly valued promise. In this way, the circle of included projects widens, and they now appear as "realizations" of the technology promise while at the same time the meaning of digitalization becomes even fuzzier.

Digitalization promises generate attention by dramatizing novelty. This is the rule rather than the exception - not least because the protagonists promise themselves followers and customers (Borup et al. 2006). Dramatized expectations are not only promising a better future, but also generate fear among the hesitant that they could be left behind in the competition and suffer a loss of control (Kieser 1997). This is, for instance, the case when German managers and politicians are warned that they could fall behind the leading nations (like the US) in the field of digitalization - a recurring argument in the arsenal of the protagonists (Faust/Bahn Müller 1996).

If digitalization has established itself as an authenticated technology promise even those actors who are skeptical about it, whose individual expectations differ from the collectively shared ones (Borup et al. 2006), can benefit from it by referring to it. They gain legitimacy if they can demonstrate any kind of digitalization, sometimes only ritual and ceremonial "realizations" without the need to prove its effects.⁴

⁴ There are numerous examples that show this in the case of AI nowadays.

Thereby, they avoid becoming questionable and vulnerable.⁵ Corporate leaders and politicians who are under pressure to succeed can count on the public's willingness to believe in the promises. Such strategic references to collectively shared expectations are part of the "Politics of Expectations" and the dynamics of expectation formation (ibid.). The ubiquitous use of the promise of digitalization decouples it from concrete ends. It becomes a suitable means for any end, an absolute means, an end in itself. It will be possible to find goals in any case. The bon mot, familiar from earlier computerization phases, is celebrating its resurrection: "The computer is a solution in search of problems" (Faust/Bahn Müller 1996).

Mainly, four types of actors decide about the digitalization promise to become relevant and their decisions are shaped by the prevailing and predominant collective belief.⁶ All these decisions bind money in the here and now and thereby exclude alternative expenditures.

- *Managers* of both challengers and incumbents invest in promising IT projects. It depends on the specific constellation of actors and the local interpretation of the collective beliefs that circulate in the transorganizational arenas how these decisions take shape, which IT projects are selected and which impact they have on the performance and competitive position of the firm. This is the main level which will be analyzed by the research project at hand (see below).
- *IT and strategy consultants* and other "promissory organizations" (Pollock/Williams 2010b) are involved in both the development and provision of alleged superior knowledge and the local dissemination of this knowledge and the proof of the practicability of IT-based solutions via consulting projects at firm level (Faust 2002). As long as the collective belief continues to exist to which they themselves have contributed they may profit from engagements by managers who themselves believe in the blessings of the new technology or fear to be accused to have missed the point.⁷
- Additionally, collective beliefs encourage *politicians* to enable and safeguard innovations through regulation and funding of both basic and applied research and promising start-ups.⁸
- Widely shared technology promises make *banks, venture capitalists, and other investors* believe in the success of such innovations, so they are willing to finance them or to invest in promising stock. These decisions have a specific impact on the dynamics of technology promises and deserve closer attention.

⁵ Similar to neo-institutionalist accounts (Meyer/Rowan 1977): Taken-for-grantedness avoids evaluation by acting in good faith.

⁶ If the focus of the analysis also includes earlier phases of the innovation process, particularly the preliminary work in the academia, other groups of actors have to be taken into account. The (changing) interaction between scientific and economic actors is of particular interest in order to understand a complete innovation field (see for the field of AI Hirsch-Kreinsen 2023).

⁷ As among investors and analysts at any stage of the development there are believers and disbelievers, including such that change from Saulus to Paulus. Thereby, these actors contribute to the dynamics of expectation building.

⁸ For instance, (local) governments regulate the conditions how autonomous driving can be tested and evaluated. The more a government believes in the blessings of autonomous driving and the seriousness and competence of the providers of the technology the more benevolent testing conditions on public roads it will allow.

3 The specific impact of capital markets for the dynamics of an innovation promise

Before we analyze the impact of the capital market on the development path of digitalization we have to note that not all new technologies are apt to be taken up by capital market actors. As Goldfarb and Kirsch (2019) show in detail, it depends on *four factors* whether or not technology promises gain sufficient relevance and may have resonance at the stock exchange: “The degree of uncertainty surrounding a particular innovation, the attentive presence of novel investors, the opportunity to directly invest in companies that specialize in the technology, and whether or not a technology is a good protagonist in a narrative” (ibid., blurb). All these conditions are given for the core digitalization projects to date and the previous phase of the Internet euphoria. Both phases are characterized by society-wide expectations and visions, the appearance of a new era.⁹

Company valuations on the capital market essentially follow the valuation of a currently highly rated innovation and hence also the digitalization promises.¹⁰ This is because analysts and fund managers do not have their own expertise in technology development and its potential applications in general or in specific industries. Instead, they must take note of the technology promises that are circulating and incorporate them into their analyses and decisions. Grand narratives, i.e., cross-industry interpretive frames such as the Internet expectations in the late 1990s, and specific industry narratives, such as those on biotechnology or nanotechnology (Froud et al. 2006), emerge in overlapping knowledge arenas and networks, where they are communicatively validated and subsequently deemed future-proof (Abrahamson 1996; Swanson/Ramiller 1997; Kieser 1997; Faust 2002). In addition to the pronouncements of technology providers, application-oriented research institutes, the business press, strategy consultancies, specialized IT consultants and other “promissory organizations” (Pollock/Williams 2010b) such as the technology analysts of the Gartner Group are also relevant in this respect.

In addition to the widespread understanding of the meaning of digitalization, which is reflected in phase-wise preferences for sectors and companies, there are two typical stock market mechanisms that amplify these movements.

The first mechanism involves *expectations of expectations*. For the financial investor, it is not only relevant how he himself assesses the prospects and effects of a technology when making investment decisions. He has to take into account the technology expectations of the majority of other market participants, too. After all, these will determine the direction of market development for the time being, and it depends on

⁹ Goldfarb and Kirsch (ibid.: 134) themselves categorize the Internet as an innovation phase of digitalization which goes along with a bubble and a subsequent crash. One of the latest digitalization projects that belongs to the recent innovation phase is autonomous driving that according to Goldfarb and Kirsch (ibid.: 158) most probably will belong to the candidates for a bubble and crash cycle.

¹⁰ This view departs from a prominent view of the financialization of the firm. In this view the shareholder value orientation of managers meant to „distribute and downsize“, whereas in the former era managers were dedicated to „retain and invest“ (Lazonick/O’Sullivan 2000). In such a view, managers are forced to maximize earnings in a short-term. This cannot be reconciled with the experiences of an innovation phase in which managers convince investors quite easily to accept low or no returns in the present in favor of a promising future. In these phases capital markets show a patience that otherwise is missing. This does not mean that capital market actors do not apply any criteria of success in order to assess progress. The criteria try to capture growth instead of current profitability comprising market share, opportunities or ambitions to capture new, promising markets, even click rates that indicate growth. This is better captured by a theory that conceptualizes the shareholder value imperative more contingent and open to context-specific interpretation (Froud et al. 2006; Faust/Kädtler 2018, 2019).

his decision-making constraints as well as his expectations of expectations whether he will follow his (potentially different) individual expectations or switch to the majority opinion.¹¹ If he follows the mainstream despite own doubt and concerns the prevalent belief will be amplified. Analysts are in the same dilemma. For instance, during the Internet euphoria of the late 1990s, some rated startups from the Internet scene more favorably compared to their own convictions because they expected "the market" to stick to the promise of digitalization and feared to be blamed by their customers for having missed current opportunities (Faust/Bahn Müller 2007).

Passive, technical reinforcement is provided by funds that track only stock indices. If the market value of companies in an index rises because they benefit from valuations of fundamentally operating funds, then index funds must replicate this. Their influence, which has been growing for a number of years, thus reinforces prevailing valuation preferences and the weight of companies benefiting from them. This has been evident recently in the case of large tech companies (Braun 2016; Fichtner et al. 2017). Tesla's enormous appreciation (before the more recent downturn) also stems at least in part from its inclusion in the S&P 500 index and the need for index funds to buy additional shares and thereby increase the market value further.¹²

The influence of the capital market on the digitalization paths is not exhausted by the reinforcing replication and amplification of the digitalization promises circulating in one way or another. In addition, there are two evaluation criteria that generate specific effects.

On the one hand, analysts and investors prefer focused companies and disadvantage conglomerates. This is reflected in a valuation discount (conglomerate discount) (Zuckerman 2000) and guides the exertion of influence. Analysts and investors demand that management divest or abandon "marginal" businesses and strengthen the "core business". Activist hedge funds lend weight to such demands with public campaigns and coordinated attacks.¹³ There are two capital market-related justifications for the preference for focused companies. On the one hand, analysts fear that they are more likely to be wrong with their earnings forecasts because of the complexity of conglomerates. They therefore prefer focused companies that they can interpret in a familiar framework and penalize conglomerates with a risk discount (Zuckerman 2000). On the other hand, fund managers claim to be able to diversify their portfolios in a way that reduces risk and deny this right to management. This follows the agency theory of the company (*agency logic*), which has gained in importance in the U.S. since the 1980s and in Germany since the 1990s compared to a *corporate logic* (Zajac/Westphal 2004).¹⁴ If the conglomerate discount is applied and leads corporations to focus on core business fields exactly those corporations are produced that specialize in a technology to which the digitalization promise refers. Thereby, one of the conditions are given that Goldfarb and Kirsch (2016) identified as a prerequisite that a technology finds resonance at the stock market.

¹¹ Note: this is a special case of the interplay between individual and collective expectations in the expectations approach within STS (Borup et al. 2006).

¹² This second amplification mechanism did not exist for the Internet innovation phase of the late 1990s because at that time index funds were an exception and not relevant yet (Fichtner et al. 2017; see below)

¹³ Thereby, they aim to take the expected share price gains on which they can rely because other market participants also prefer focused companies, buy shares and thus drive up the share price. However, this only occurs if management responds to the demand and sells or announces the sale of non-core parts of the company (Fichtner 2015).

¹⁴ Agency Theory postulates the primacy of shareholders vis-a-vis other stakeholders as a guideline for management while a *Corporate Logic* implies a self-interest of a corporation to survive and to grow sustainably which is bound to the interests of all stakeholders that have to be consolidated by management.

On the other hand, analysts and investors prefer technology-driven *challengers to incumbents*. This is reflected in an incumbent discount (Benner 2010), a lower stock market valuation of the incumbents compared to the challengers. This valuation discount often comes into play when challengers from outside the industry attack established industries based on their specific competencies in a new technology. An apt example is digital photography (ibid.). The challengers from electronics were perceived as being more likely to realize this innovation than the established manufacturers of analog cameras, even though the latter had a competence advantage in optics (lenses). Currently, the attack of "tech corporations" like Uber or Alphabet (Waymo) in the realm of the traditional automotive industry is a prime example of how the previous "rules of the game" (Fligstein/McAdam 2012) become challenged.

Combined with the preference for corporations that can rely on the prevailing digitalization promises the valuation preferences (conglomerate and incumbent discount) favor focused companies specialized in digital technologies over traditional companies from traditional industries. This may have lasting effects that survive the lifecycle of an innovation phase.

Start-Ups and listed companies that rely on digitalization, be it as a provider or a promising user of new technology, can benefit from this valuation pattern during innovation phases. This leads to a remarkable inflow of financial resources by rounds of funding of Start-Ups, their going public and subsequent capital increases that generate capital inflows for already listed corporations. Additionally, these may use their exaggerated stock market valuation to finance acquisitions and to attract highly sought-after experts by offering share options as a salary (Mager/Meyer-Fackler 2017). On the downside non-listed corporations are disadvantaged because they lack these resources and nevertheless, often have to compete with the former or buy their highly appreciated products. The (often) remarkable rise of valuation is accompanied by the risk that a stock market bubble generated in this way will burst, which, depending on the extent and type of financing, can lead to a veritable economic crisis (Goldfarb/Kirsch 2019; Staab 2018; Faust 2023).¹⁵ In this way, the previous shift in power may be revised again.

4 Feedbacks of Expectation Formation and Realization Attempts

In the long term, the dynamics of expectation formation become fed back into the dynamics of realization attempts (Kowol 1998). Whether digitalization promises can be kept only becomes clear step by step. Achieved interim results remain ambiguous for a long time. Even if experiences with earlier digitalization waves urge caution, the protagonists point to the completely new technological potential of the current digitalization push, which devalues earlier experiences: "This time it's different". The expectation that the desired and predicted success will materialize after all can last a long time. Thus, in the knowledge arenas

¹⁵ Shiller (2019: 119) suggests that the downturn of the stock market is itself perceived as an indicator of a more general economic decline by some observers although economic indicators do not necessarily support this assessment. Thereby the stock price indices are taken as an oracle (ibid.). The general public and the business community takes the burst of the bubble at the stock market as a direct indicator that corporate managers do not believe any more in the formerly prevailing digitalization promise despite the fact that no clear evidence is available that corporate managers reassess its investment decisions. Thereby, stock market valuations are taken as an early indicator for the more general decline of the belief in the former innovation promise. If institutional investors, the experts of the economic valuation of firms, arrive at the conclusion that the new technology does not live up to its promises why should „normal“ observers come to a different assessment?

and on the capital market, the promise of digitalization can persist even when it is already being increasingly questioned within organizations (Meyer 2020).¹⁶

Realization problems and the failure to achieve the expected success may lead to the original promise becoming untrustworthy. The creeping revision of expectations draws attention to disappointments and non-anticipated and non-intended effects that were previously overlooked within organizations and the broader public in light of brilliant expectations. Doubts and reassessments formerly only circulating informally, can now be thematized officially. Thereby, new decisions are possible. Experts previously sidelined now see their chance to raise their voices and regain status and influence. The business press reports more often about problems and failures than successes, successful people and “excellent” companies. Finally, conferences, industry fairs and media no longer even discuss the topic. Digitalization which had dominated the discourse until then moves to the back pages and becomes an expert topic in specialized journals again.

In more general terms: If the cause-and-effect beliefs that are part of the digitalization promise erode in the course of becoming aware of cumulative inconsistencies that can no longer be explained and dealt with in the previous paradigm, “tipping points” may occur at which the prevailing technology promises become implausible and invalid. It is impossible to predict when such a tipping point will be reached. Other innovation promises may then become valid but like the previous ones, these are selective, addressing particular problems and proposing specific technical-organizational solutions, while ignoring others. The promises of each favored socio-technical concept are prone to refutation and blind to side effects. This can lead to a cyclical reappearance of prevailing innovation promises, which then, however, always encounter a meanwhile altered economic and organizational world (Deutschmann et al. 1995; Deutschmann 1997).¹⁷

When the exhaustion of a digitalization promise that proceeds gradually and often under the surface of public awareness arrives at such a tipping point seemingly out of a sudden decisions change. A majority of financial investors readjust their valuation schemes. Venture capitalists no longer support IT start-ups and their financial resources dry out. IPOs and capital increases are suspended. The stock market valuation of tech firms dramatically collapses while the value of incumbents and corporations from other fields may rise at least relatively. Managers that expected that their firm would profit from investment in IT stop related projects and have to write off investments. While formerly IT projects and IT expenditures were highly valued, now the IT is perceived as costly, vulnerable and complex although it is still acknowledged as indispensable for everyday operations. While formerly quite naively new IT projects have been welcomed without scrupulous cost-benefit analyses now even reasonable IT projects may be rejected based on a general skepticism regarding the blessings of digitalization. In sum, all this may have larger economic effects and may be a major cause for an economic crisis in interaction with other economic factors.

¹⁶ Whether or not and how visions of the future have come true is the topic of the historian Jochen Radkau (2017). The title of his book „The History of the Future“ („Die Geschichte der Zukunft“) indicates an ongoing task not only for historians.

¹⁷ Tipping points are in some respect similar to picture puzzles (Vexierbild). The same drawing in one moment shows a rabbit and in the other an ant as in the most popular example of a picture puzzle. This switch does not rely on any properties of the drawing (physically the drawing remains unchanged) but is only due to the changing perception of the observer. Similarly, the economic data of a given entity do not change but its interpretation in a different frame. What once was an indication of a promising future is now perceived as a misguided investment that leads to a lasting economic failure.

However, technology promises can also be fulfilled (partly or even to a large extent) and provide some companies with the competitive advantages they have promised themselves and others. In some cases, lasting competitive advantages may arise, but these can usually only be achieved with quasi-monopolies like Amazon's marketplace or Google's Internet search (The Winner Takes It All). More often originally innovative technologies and their deployment concepts can also be established as a taken-for-granted socio-technical "solution" through subsequent generalization via imitation and institutional support. The resulting homogeneity ("isomorphism") causes the original innovation to disappear; it is no longer recognized as such and loses its potential for "creative destruction". Digitalization which started as a promise of innovation thus produces stepwise a generally accepted socio-technical infrastructure (Pollock/Williams 2010a) such as the Internet and related applications such as e-mails.¹⁸ In the long-term socio-technical change produced or enabled by meanwhile taken-for-granted technologies may, nevertheless, cause a gradual transformation of economic fields, work or the life-world communication culture (Dolata 2011a).

Digitalization is thus, on the one hand, a process of implementing, applying and using digital technologies that has been progressing step by step for decades, generating a digital infrastructure over the course of time. Advancing digitalization translates in corporate functions as well as features of processes and products that become increasingly taken for granted. Such an infrastructure becomes indispensable (must be had); but it wants to be maintained and incrementally developed, while at the same time the systems become increasingly complex and vulnerable through ever new "layerings" or "attachments". Each new step in further development is linked to these legacies of previous digitalization. The propensity of IT systems to grow self-sufficiently and at high cost must be stopped time and again.

On the other hand, there are innovative thrusts from time to time that are made possible by technological innovations. They are driven and supported by collective digitalization promises and materialize in new types of applications. The result may be a path-breaking innovation that gives particular firms a leading edge. Accordingly, we propose to distinguish between two phases in which digitalization is given a different meaning and relevance:

In *innovation phases*, the innovative possibilities and effects of new digital technologies are emphasized and expressed in (often far-reaching) expectations or promises.

In *consolidation phases*, digitalization is seen as a self-evident and indispensable informational infrastructure that management must "keep under control" because it is complex, vulnerable and costly.

Consolidation phases follow innovation phases when digitalization promises have been disappointed. But even when the digitalization promises have largely been fulfilled and the once innovative use has become generalized, a consolidation phase can follow because it is recognized that the layers build up over time increase complexity, vulnerability and costs. In consolidation phases in which digitalization is not (any longer) considered an innovation promise, other innovation promises can gain prominence.

With the following historical sequence of phases in the creation of meaning and relevance in digitalization, we want to demonstrate the fruitfulness of this proposition. Due to the pointed presentation, it is

¹⁸ For example, this holds true for the formerly revolutionary telephony which was initially accessible only to the privileged and then became affordable for broader strata, first in the USA and after the Second World War also in Europe, and thus ultimately became a matter of course (Rammert 1990). The same could be said about ERP systems (e.g. from SAP) or the mobile phone and its successor, the smartphone (Schrape 2021).

pushed into the background that in each phase the prevailing meaning does not remain unchallenged. However, this does not exclude the occurrence of the "tipping points" (mentioned above) when doubts and objections gain ground and the overall picture changes.

In which respect are digitalization promises special and may have more widespread economic effects?

We already have discussed the question under which circumstances the decline of a technology promise may have major negative consequences with respect to the economic development. The provisional answer was that an economic crisis is more likely if the expectations that previously triggered financial and physical investment in new technology do not lead to economic returns that legitimate these investments. Hence, in this case previous investments that stood in competition to other potential purposes will have to be written off and this may have major economic consequences. This answer although convincing is not sufficient. It does not distinguish between the different scope of the new technology to which the respective promise refers. We argue that the scope of digital technologies and related promises is broader and hence the potential effects of its decline are far-reaching compared to other technologies and the related promises. This is the case because the core of the digital technology, the computer is a universal machine¹⁹ and it can only be an universal machine because it is a symbol operating machine.²⁰ Other machines or technological artifacts are either single purpose machines or versatile machines that only can be used in a circumscribed field of activities and hence have only a field-specific impact (for example "gene scissors" like Crispr or fuel cells).²¹ It makes a decisive difference whether the new technology refers to a more circumscribed field or has a broad, economy- or even society-wide application scope. In the case of the universal machine both the envisaged applications and the related investments cover the whole economy and the public sector and thus a broader mismatch may result between the undertaken investment and expected returns while at the same time in many societal fields alternative usages of the invested money have been ruled out.²² This argument is still a hypothesis that has to be substantiated by historical research including the comparison of different phases in which digitalization promises played a decisive role (Faust 2021).

¹⁹ Apparently, this does not follow the definition given by Alan Turing (1937). He called a computer with a stored program control a universal machine.

²⁰ Programming and the possibility of an infinite number of such programs allow for the applicability to whatever problem. All problems that can be formalized can be represented symbolically by any digital technology. This universal applicability of computers at the same time results in its restrictions. Only problems that can be formalized can be addressed by computers and it can only represent symbols that can be transformed into digital distinctions (of whatever physical substance). Sub-symbolic Artificial Intelligence (AI) that nowadays attracts so much attention avoids the restriction of being rule-based, however, only at the expense that it can only produce probability-based results. Both symbolic and sub-symbolic AI rely on digital technologies (for a discussion and critique of symbolic and sub-symbolic AI based on digital technologies see Dreyfus 1985; Hirsch-Kreinsen 2023; Otte 2023).

²¹ For the case of fuel-cells see Budde/Konrad 2019.

²² In the past, in many countries ministries of education have dedicated a major part of their budgets to the digitalization of schools expecting better results regarding PISA. More recently, the frontrunners of PISA like Finland and Sweden cut back the expenditures for the digitalization of schooling. They reacted to research findings that showed that the digitalization of the teaching process was not only useless but detrimental for the intended improvement of schooling. The money that was spent for digital technologies now is missing for specialized programs to promote socially disadvantaged children that has been rediscovered as the main solution for the proclaimed purpose (<https://www.morgenpost.de/politik/article406933726/daenemark-zieht-die-notbremse-bei-digitalem-unterricht.html>).

5 The Internet Euphoria: Rise and Decline of an Innovation Phase

5.1 Secondary Analysis of Interviews and Case Studies from a Previous Research Project

For the analysis of the sequence from an innovation to a consolidation phase that refers to the rise and decline of the so-called „New Economy“ we resort to qualitative interviews from a previous research project which can be analyzed secondarily (Birke/Mayer-Ahuja 2017; Mayer-Ahuja et al. 2019; Richter/Mojescik 2021). The project conducted in the years 2005 and 2006 analyzed the contribution of IT consultants to IT-based innovation in traditional companies of the „old economy“. In public and scholarly attention the innovation phase of digitalization mostly was demonstrated by the rise of new entrants (challengers), often the providers of the new technology, and their success on capital markets (for Germany see Huchler 2002; Kühl 2002). Nevertheless, the traditional industries were affected by the circulating digitalization promises, too. Which relevance did IT-projects and IT-investments have in these companies? For which purpose did managers engage consultants and which type of consultancies was typically engaged for the different and changing purposes? How did the role of CIOs change in this time span? Answers to these questions may be seen as indications for the rise and fall of a digitalization promise and may be used for comparisons with other phases in which digitalization plays a similar role despite a variety of differences.

The research project, used for the secondary analysis of interviews and case studies, had the title „Innovative Capabilities and the Role of Consultants in the Information Economy“. It was funded by the VW-foundation from 2005 til 2007. The Center for European Economic Research (ZEW) (Bertschek), the chair of Organization Studies at Mannheim University (Kieser) and the Sociological Research Institute at Göttingen University (Faust) participated in this interdisciplinary research project. For the secondary analysis the qualitative sub-projects from Mannheim (Kieser) and Göttingen (Faust) are particularly suited. The latter sub-project analyzed to which degree IT consultants contributed to the field-related definition and dissemination of IT-based innovation. It conducted problem-centered interviews (Witzel 2000) with heads of IT-departments (CIOs), IT consultants, scientists from (applied) computer science and representatives of professional journals. The other sub-project analyzed how companies selected and cooperated with IT consultants guided by the hypothesis of an increasing client professionalization going along with the downturn of the consulting business since the turn of the millennium (Jung 2010). This was pursued by seven case studies of mostly larger companies which comprised problem-centered interviews with managers of different departments and consultants that were engaged for IT-projects. The date of the interviews is well suited for the comparative analysis of the innovation phase of digitalization (1995 til 2001) and the subsequent consolidation phase (2001 till 2005). The respondents were well aware of the change that occurred in this time span and they frequently thematized it on their own without being asked, e. g., when CIOs talked about the changing relevance of innovative projects, the need to consider IT costs or to demonstrate value contributions and their reduced power position vis-a-vis business management. IT consultants explained the changing purposes for engagement or selection procedures. The previous research project did not address the research questions raised here directly, nevertheless, the available interviews may answer them at least partly.

5.2 Selected and Provisional Results from Ongoing Research

The Internet Euphoria showed itself not only narrowly as a new guideline for managers how to position themselves in a turbulent world vis-à-vis competitors. As in many cases in which technology promises take on the character of a “grand narrative” (Froud et al. 2006) the Internet euphoria promised a new era.²³ A “new economy” was supposed to replace the old one giving room for a new way to work (Mayer-Ahuja/Wolf 2005). Not only business will be affected but life-worlds and new horizons would open up for democracy. In the following, we concentrate on the (changing) strategic relevance of the digitalization promise for managers and consultants. However, we have to keep in mind its wider aspirations promising a seductive future going along with a thrilling dramatization of newness. This probably enhanced the persuasiveness of the otherwise more mundane decisions at company level.

Capital Market Evaluation as a Mirror of Trust in and Disappointment about a Digitalization Promise and its Consequences

In the following, we will provide a brief account of the role of capital markets for the rise and decline of the digitalization promise of the Internet era which has been shown by a variety of scholars (Shiller 2016; Goldfarb/Kirsch 2019). How the valuation on capital markets relates to technology promises in general, has been developed elsewhere in more detail (see 3). Here we only recall key insights. Capital market evaluation is a mirror of trust in and disappointment of the digitalization promises. Moreover, they help to amplify the effects of digitalization promises. Two main channels have become identified through which this occurs. *First*, expectation of expectations lead financial investors of all kinds to allocate assets to companies “as long as the music plays” even if they do not believe in the prevailing promises. Accordingly, the same mechanism is effective if the business world and the financial community does not any more believe in the promises that were previously in place.

The *second* mechanism goes back to the gradual rise of index funds which resulted in a remarkable influence on the value fluctuations at stock markets. Nowadays, large parts of the investment volume does not go back to explicit decisions of fund managers but occur automatically because index funds have to replicate the upswing of firms independently from their own assessment of these valuations. This also holds true if the expectations are disappointed later and thus reinforce the dramatic devaluation that results from these disappointments. However, this specific amplifying mechanism did not exist in the earlier phase of the Internet euphoria because index funds did not play a major role in this period (Braun 2016; Fichtner et al. 2017).

Besides the amplification mechanisms capital market influence in general advantages challengers from the tech industry vis-à-vis incumbents which is due to the specific valuation patterns of capital markets and its interplay: the incumbent discount (Benner 2010) and the conglomerate discount (Zuckerman 2000; Faust 2021).

When following these valuation patterns capital markets induce financial investors to allocate assets to start-ups and (listed) corporations (IPOs, capital increases, purchase of stock) and hence enable specific

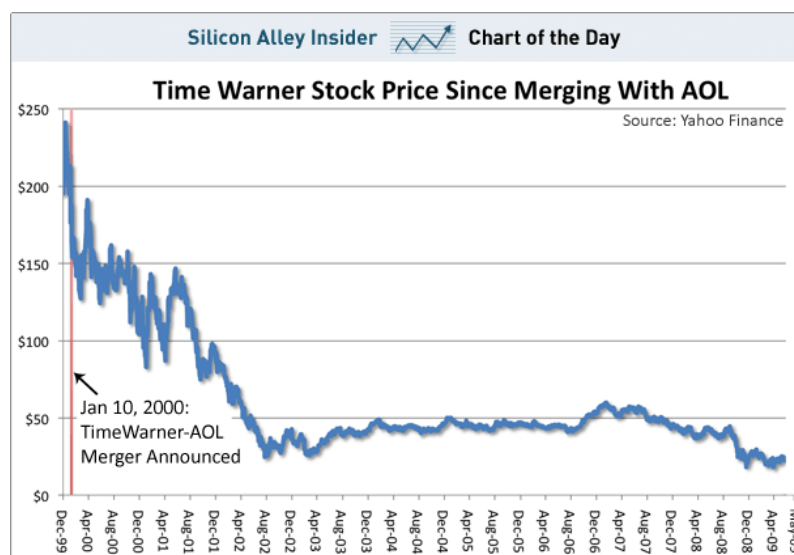
²³ The Internet became originally developed in the context of science communication. There it had a limited meaning and purpose. It was only when it was discovered for the business world that the digitalization promise “E-business” emerged in all its variants (Allmeier 2020).

companies to obtain additional funding and market value increases which gives them a variety of advantages vis-à-vis competitors. These financial flows occur in the present although it remains unclear whether the technology promises will pay out in the future and justify the flow of assets it has evoked.

Regarding the Internet era, all this is particularly true for the US with its developed capital markets (large institutional investors, venture capital firms) and the high degree of listed corporations. The collective belief in the blessings of the Internet for the US economy and its firms manifested itself in a tremendous increase in the stock market valuation of corporations that either offered new technology (like Cisco) or made promising use of it (like AOL or Amazon).²⁴ However, stepwise the promises related to the advance of the Internet became increasingly doubted. Analysts, fund managers and the business press interpreted missing profits as a proof that obviously the promises are not and cannot be kept whereas previously missing profits indicated growth that would result in gushing profits in an imagined future.²⁵

At a tipping point, that could not be predicted by anyone these doubts cumulated to a general disbelief in the formerly predominant promises. This resulted in a general crash of the stock market valuation and manifested itself in a crash of the main indices, particularly the Nasdaq, and of corporations that had profited most from the “new economy” hype. The sudden and stunning breakdown of the stock market in 2000 was also due to the fact that previously fund managers continued to stick to the predominant valuation schemes even if they were not any more convinced of the underlying narrative. The fear of missing out (FOMO) on the ongoing increase of the value of tech firms led them to continue the former investment strategy „as long as the music plays“.²⁶

Chart 1: Stock Market Valuation of Time Warner (after the Merger with AOL)²⁷



Source: <https://www.tomcuthbert.com/blog/2009/05/30/aol-i-finally-got-one-right-fb>

²⁴ Beunza and Garud (2007) convincingly showed this for the Amazon case.

²⁵ The possibility of a looming crash became more and more realistic expressed by the increasing mention of the term „stock market crash“ in news and newspapers (Shiller 2019: 232).

²⁶ Timing matters. Analysts or fund managers that warned too early that a current valuation could be revised soon are in danger to be criticized and potentially punished by investors if this does not happen in the short-term. In turn, this could lead to a negative performance assessment of the analyst according to the performance criteria of the brokerage house to which these belong (Faust et al. 2011).

²⁷ The devaluation of AOL caused a 100 billion \$ depreciation of AOL Time Warner. Later the name AOL vanished completely again.

Chart 2: Stock Market Valuation of Cisco

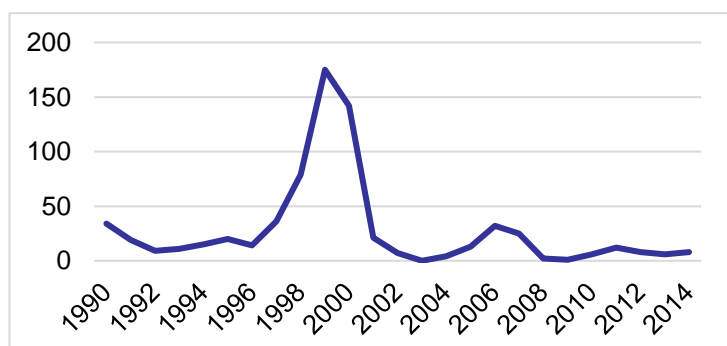


Source: *finanzen.net*

Germany's economy was traditionally different from the US and it is still so till today. This refers to the fact that the corporate governance system still gives employees (and their representatives) considerable voice in strategic decision making on board level. Moreover, the German economy is persistently characterized by a high share of non-listed companies (family-owned, cooperatives, foundations) and a majority of listed corporations that exhibit anchor investors protecting the firm from capital market pressures (Faust/Kädtler 2018, 2019; Faust/Thamm 2016). Nevertheless, during the 1990s the picture changed considerably in some respect that is relevant here. This was a time in which globalization of both ideas and concepts and economic actors proliferated. In these times, we witness the rise of institutional investors as shareholders of listed corporations, often coming from abroad.

Even more important for the upswing of the “new economy” was the fact that for the first time venture capitalists, formerly almost unknown in Germany, financed start-ups. They even encouraged start-ups to accept additional capital and urged them to expand to other countries, particularly the US (Huchler 2002; Kühl 2002; Faust et al. 2011). Moreover, the sector of listed corporations expanded. IPOs and capital increases showed new highs, never to be reached afterwards (Faust/Thamm 2016; see Chart 3). The US that had recovered from the industrial crisis and so-called Japan shock of the 1980s meanwhile was seen as a role model in Germany promoted by globally operating management consultants and an increasingly transnational business elite (Faust 2002). Thus, the “new economy” not only appeared as a silver lining on an imagined horizon but as a reality elsewhere.

Chart 3: IPOs in Germany on Regulated Markets

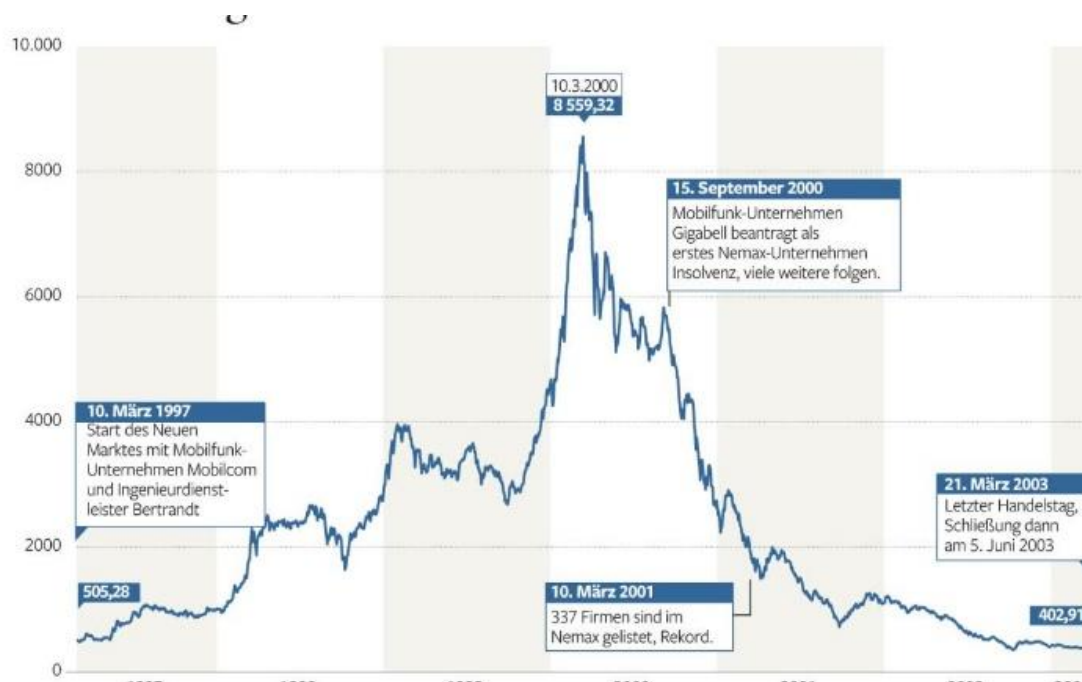


Source: Faust/Thamm 2016, 9.

The listing on the stock exchange became a major exit option for venture capitalists (Kühl 2002). The stock market value increased dramatically. Most spectacular was the establishment of a new index of the German stock market (organized by “Deutsche Börse”) in 1997, the so-called “Neue Markt”. It had lower standards (e.g. regarding profitability) and was explicitly dedicated to the “new economy”. For many observers this marked the advance of a new era in which the German economy could face the US on an equal footing (see Chart 4).

Most of the upswing of the financialization of the Germany economy during the 1990s was due to the digitalization promise gaining ground as idea and concept. The collapse of IPOs, the dramatic decline of stock market values, particularly of the “Neue Markt” (closed down in 2003) and the insolvency of new economy firms reflect the erosion of the former belief in the blessings of digitalization, especially in the potential of the Internet to establish predominant business models. The imaginations of the (imagined) future changed and thereby the former allocation of financial means.

Chart 4: The Rise and Decline of the Stock Exchange Sector “Neuer Markt”



Source: <https://www.welt.de/finanzen/geldanlage/article116826994/Als-Aktienkurse-um-2800-Prozent-nach-oben-sprangen.html>

Besides a variety of smaller and newly established firms also large listed companies exhibit the same extreme fluctuations in its valuation. The stunning example is the Deutsche Telekom AG, one of the largest telecommunication firms worldwide until today. Formerly, the business belonged to the state-owned Deutsche Bundespost. It was separated and privatized in 1994 and became a public corporation listed at the traditional German stock market in 1996. The IPO generated 10 bn €. In 1999 and 2000 (shortly before the breakdown) two capital increases followed that raised another 25 bn €. The German government propagated the share as “Volksaktie” (people’s share) and launched a multi-channel advertising campaign exhibiting popular and trustworthy TV actors. Due to its deliberately chosen characterization as “Volksaktie” ordinary people trusted in the promised future. Beginning in 2000 the value of the share collapsed in a rather short time and it never reached the highs exhibited during the Internet hype. The

changing belief in the blessings of digitalization went along with the end of dreams to become rich out of nothing for ordinary people.

Chart 5: Deutsche Telekom AG – The Rise and Decline of a “Volksaktie”



Source: *finanzen.net*, 15.04.2024

Perceptions and Effects of the Rise and Decline of Digitalization Promises at firm level

As already noted, it is important to distinguish between the relevance and effects of digitalization promises regarding the (alleged) main beneficiaries of a digitalization promise, mostly providers of new technology and accompanied business models, and other companies, mainly seen as (potential) applicants of these offers. The former are frequently characterized as challengers potentially “disrupting” the business models of incumbents offering similar products or services. Most of the companies, addressed in the envisaged research, do not belong to the group of challengers. The interviewees are either mere observers (journalists) of the development or more or less directly affected by the digitalization promises. They rely on own experiences with the development (CIOs, other managers, IT consultants). All CIOs have been interviewed as representatives of a firm. In some cases (company case studies) the IT consultants are part of a case study because they had an assignment with one of these firms. In the rest of the cases (subproject Göttingen) both CIOs and IT consultants are not part of a case study but stand in their own right. In these cases, reports from the stand-alone CIOs and IT consultants cannot be re-examined by the viewpoints of other members of the firm (e. g. managers of business lines). This is only possible in case studies. Nevertheless, also stand-alone respondents do not only rely on their experience in the present firm but often also in their wider career and in other firms.

In the following, we present some of these stand-alone voices, a random selection from the larger sample. This only should deliver a first impression and to show that the basic idea of the envisaged project holds. The rise and decline of the digitalization promise did not only matter for start-ups and challengers but also for traditional (incumbent) companies. Notwithstanding these insights, there are a variety of tasks to make the accounts more suitable for historical comparisons. Some of these will be addressed in the outlook.

Respondents from all groups acknowledge that the last 10 years (looking back in 2005 or 2006) have been characterized by a rising relevance of IT-topics for managers and firms as well as for IT consultants followed by a decline since the burst of the so-called Internet bubble.²⁸

„During the first five years the relevance of IT enormously increased supported by the Internet bubble. At once, members of the board considered IT as extremely important and they were ready to spend more money on it. The decline came in 2000 or so, 2001, at the latest in 2003. Then the great disillusion came up – that you can't disrupt business life as such with IT“ (Chief Editor, IT management magazine).

A consultant of a large, international IT consultancy noted that IT had become a means in itself.

„Especially in these Hype times many IT projects have been conducted for the sake of IT alone. We have seen much investment in things which de facto made no sense. I remember projects in banking (...) and it turned out that only five people were using it later“ (IT Consultant A).

Spending a lot of money was no matter at all, rather it was poured out with a watering can (in German: mit der Gieskanne ausgegeben) (CIO, company N).

A consultant from another consultancy, also operating internationally, remembers similar experiences.

„Everybody followed the hype. (...) Plainly this meant that the potential of these technologies have been over-estimated ruthlessly“ (IT Consultant C).

In these times – he recalls – he acquired a larger project. The client wanted to develop a complete new, comprehensive IT strategy with emphasis on E-business thereby reacting to a variety of scattered initiatives throughout the international company. The resulting project lasted several years. In the initial analytical phase it comprised 10 consultants, in the following implementation phase up to 30 consultants belonged to the project. The considerable costs of this large and lasting consulting project have not been questioned by anyone.

In the following consolidation phase, when the former narratives had been demystified, new IT projects could only be launched if the CIO could make clear the „business case“. The former lack of interest for IT costs was followed by a pronounced cost awareness. This not only referred to new projects but also to the complete IT infrastructure.

„That's gone, (...) because everybody is more interested in the business case for every project. IT is much stronger than before under cost pressure. (...) Nowadays, the focus is more on cost savings and to optimize the IT infrastructure. This is a real trend“ (IT Consultant A).

Several CIOs made the same experiences and report that they are under constant pressure to reduce costs and to „prove“ the usefulness of IT projects.²⁹ When the „bubble burst and the old economy stood there

²⁸ The increasing relevance of IT consultants manifested itself both in the rising business volume they could generate and in their (partly successful) attempts to address the board level and thereby to catch up with management consultancies like McKinsey or The Boston Consulting Group. The flipside of this development was that strategy consultants founded IT related subunits. IT consultants also became relevant in constructing imagined futures that referred to the use of promising IT technology (Bloomfield/Vudurbakis 2002; Pollock/Williams 2010b) - a specific shift in the general provision of management concepts by management consultants (Heusinkveld/Benders 2012; Kieser 1997; Faust 2012, 2002). The rise of the IT consultant during the 1990s induced some researchers (Kipping 2002) to identify a „third wave“ of management consulting development by which traditional management consultants were gradually substituted by IT consultants. At the time writing Kipping and colleagues could not know that the exceptional rise of the IT consultant was only a passing phenomenon which was reversed when the digitalization promise ran out (FEACO several years).

²⁹ A literal proof is not possible. Any cost-benefit-analysis can only be an estimation of future events based on its probability and a theory of cause-and-effect-beliefs which can be questioned by good reasons. A predominant imagination of the future always contains cause-and-effect-beliefs (Beckert 2016) and thereby influences the probative force of plausibility arguments.

as the winner“ (CIO company N) cost savings were top on the agenda. The CEO of company S was cited by its CIO, proclaiming: „We do not want to introduce technology.“ This was considered as a clear refusal of the means–ends reversal of IT applications.

The time after the burst of the bubble was characterized by the consolidation of the existing IT infrastructure. The Internet opened IT applications to the wider environment of firms: customers, suppliers, the general public. This and the increasing complexity that went along with it brought up the new issue of IT security, an additional topic in the consolidation phase that followed.

„The last years, when I talk to my colleagues, what do they do all of them? They consolidate their SAP systems. This is their top issue. Many think about to outsource some of their activities what also we have done. And additionally, one issue about which everybody is talking is IT security. (...). This is really coming up“ (CIO company N).

Consolidation also meant the reduction of resources for the IT department and the concomitant stress to keep the basic services running. As a result, the leeway for innovation initiatives shrinks considerably. One of the respondents is apparently upset by the recent development. We document a larger passage of the interview to give an impression of his experiences and how he feels about it.

Let’s talk frankly. (...) First, in the meantime we have tremendous stress in the IT only to guarantee the basic service. We have tremendous pressure regarding resources. Time and again, the IT has been a target for the reduction of money, costs and resources. In the meantime 80 percent of my resources are dedicated for operations. And the rest I have to keep free. In order to be innovative, creative I have to scrape something together. That’s really difficult for me“ (CIO company S).

He is assessed primarily by the availability of the existing systems. If he does not perform outsourcing is put on the agenda.

„I cannot be creative without good reasons. I do not have this leeway because I will be judged on basis of the availability of the systems. This is completely clear.“ („without complaint“ – remark of the interviewer) (...) „That’s it. If this does not work then automatically the issue offshoring, outsourcing, nearshoring pops up with all its consequences“ (CIO company S).

The methods of the assessment of new projects may have not changed formally. However, the reference to the business case clearly has become top priority.

„The complete E-Hype was made without business case – completely obvious. Surely today there are still some firms that can do without. However, today it is enforced – that the usefulness of innovative solutions is questioned“ (CIO company S).

All respondents acknowledge that in the meantime (2006) stepwise the topic innovation comes up again but in a more modest way. It is not put into the shop window („in’s Schaufenster stellen“) as it used to be in former times. It is not „decisive for the outcome of the war“ („kriegsentscheidend“) anymore.

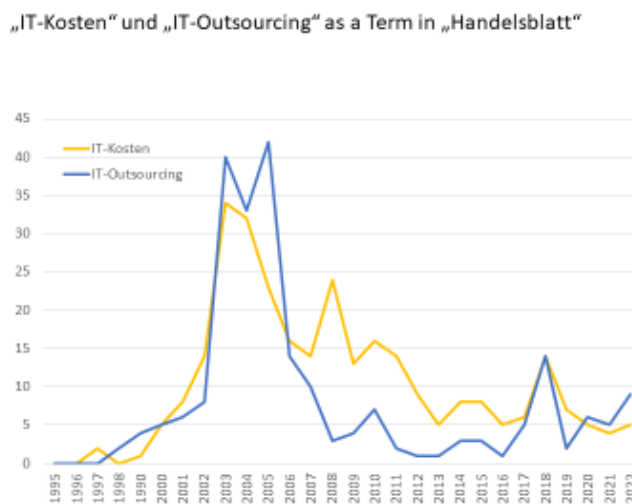
„And if the CIO did his homework regarding consolidation, harmonization, standardization the company concedes him to come up with proposals regarding new technology. Otherwise, quite often they will hear that they should make their homework first. And today it is not the case that someone has only to present a hip technology to get money thrown after him. Just saying, no matter, just do“ (Chief Editor IT management magazine).

Thereby, the status of the CIO changes and he loses influence vis-a-vis business management. If innovative ideas come up again they usually do not come from the CIO but from business management. For the CIO it is difficult to shift to innovation given the former consolidation phase in which the „penny pinchers“ („Sparfüchse“ in German) had the lead and standardization and cost-driven outsourcing had priority.

Under these conditions, he was not able to push innovation. That is how the chief editor of the IT management magazine observes the development. Being professionally dedicated to the wellbeing of the CIO, regretfully he has to note that it is mostly not the CIO but business managers that nowadays come up with new ideas how to streamline and accelerate processes.

What we have heard from the different voices from business is also reflected by the cycles of attention for topics like IT-costs, IT-controlling and IT-outsourcing, measured by its occurrence in the business press (Handelsblatt; see Chart 6).

Chart 6: The Rise and Decline of “IT-Kosten” and “IT-Outsourcing” as a Term in the German Business Journal “Handelsblatt”



Source: Handelsblatt Archiv, own calculations

6 Conclusion and Outlook

Ideas about future potential applications of digital technologies and their effects, as well as the promises they hold for the strategic positioning of companies are necessary to turn a (still) undirected search and experimentation into innovation. Decisions under uncertainty require collectively authenticated expectations that it is sensible, desirable and promising to start a project, to align one's career with it, to promote it and to finance it. The core of the argument presented here is that imagined futures frame current decisions, both with respect to technology-based innovations and with respect to (financial) investments in firms, the valuation of which is in turn influenced to a greater or lesser extent by technology expectations. Capital market expectations, valuations, and influence draw on, reinforce, and strengthen prevailing innovation promises. In addition, the preference for challengers over incumbents and the preference for focused companies in the current innovation phase encourage "innovators" from the tech industry, while traditional industries fall behind. The mechanisms described can also shape the future perception and relevance of digitalization if the original promise of digitalization cannot be realized (or can only be realized imperfectly) because resources of various kinds have been mobilized in the past that now have to be written off. Capital markets can be of considerable importance regarding the shift in the meaning and relevance of digitalization and the economic consequences it may have.

Innovation promises are not always digitalization promises. Only in certain phases does digitalization gain the significance and relevance of an innovation promise. Increasing disappointments may trigger revisions of expectations in which the complex, costly and vulnerable IT infrastructure in the meanwhile is seen as in need of consolidation, while other innovation promises may come to the fore. This change in innovation promises can mean that companies that have focused entirely on one particular innovation promise suffer particularly from subsequent disappointments and revisions of expectations.

These conceptual considerations may be used to reinterpret ongoing and previous research. The paper at hand does this by using research that gives insights into a former succession of an innovation to a consolidation phase: the Internet euphoria and its decline. We do not recapitulate the results of the endeavor but point at some of the most relevant shortcomings of the research so far.

First, the findings rely on selective and provisional results that could be (probably not completely) be revised or modified. This refers to the fact that we did not analyze case study evidence so far which may give us a richer picture by contrasting the view of CIOs and IT consultants with the perspectives of business managers. Moreover, we have to be aware of the fact that not all CIOs or firms react to the digitalization promise in the same way. Some try to be front-runners, others are more hesitant, many interpret the expectations in a specific way that fits best to the local power distribution and local sense-making (Meyer 2020; Czarniawska/Joerges 1996). In how far we are able to capture the “politics of expectations” (Borup et al. 2006) on company level cannot be answered so far.

For a historical comparison with other phases, we need richer accounts of the IT projects and its specifics that have been initiated and undertaken in the innovation phase. We hope to get more information on this issue by a more comprehensive analysis of the interviews.

Second, the findings produced on the basis of a secondary analysis of previous research have its specific shortcomings. This refers to a variety of issues. (1) The previous research had a focus on traditional firms and does not cover challengers, particularly start-ups. (2) The relevance of capital market exposure and its effects have only been discussed by chance throughout the interviews. They should be taken into account more systematically which is difficult to achieve with this sample because most of the firms are not themselves listed at the stock market or plans to do so. (3) The ways how the Internet euphoria emerged and vanished, the process by which this came about, the arenas in which it happened and the groups of actors that produced and challenged the predominant narratives are not systematically addressed in the interviews.

All these shortcomings need to be considered in a more encompassing research design. For the envisaged research project, we might be able to address some of these shortcomings. There we plan to conduct a comprehensive media analysis (business press) that covers the whole time span. It could give more answers to some of the issues that could not be addressed by the secondary analysis. Moreover, it could cross-examine its findings by giving information about a broader sample of firms.

In a historical comparison, the way how the capital market values companies and the innovative capacity of digitalization has to be researched in more detail. It should comprise the analysis of research reports of stock market analysts over time and interviews with fund managers and investor relations departments of listed corporations. This and other issues should be dedicated to a broader comparative research that has yet to be designed.

Besides these shortcomings, the more general approach and the provisional findings could give rise to some cautions regarding research about the “digital economy” in the present. It should be borne in mind that the findings from current digitalization projects represent an interim status that is due to the experimental nature of the innovation process and the still uncertain prospects for success of the projects (Dolata 2011b). Digitalization projects that are analyzed today may be abandoned tomorrow because they fail to meet the initially exuberant expectations that drowned out all skepticism and doubt. All in all, this calls for caution when interpreting current findings. Research findings from earlier phases of digitalization and their theorization can serve as a useful corrective.

At present, observers run the risk of succumbing to the whispers of the “Zeitgeist” and the overwhelming influence of being a contemporary – even if the prevailing promises of digitalization are critically examined for negative aspects. A pronounced dramatization of novelty has taken hold, all the more since Artificial Intelligence (AI) in the form of ChatGPT has been published and till today thrills business and the broader public (Hirsch-Kreinsen/Krokowski 2024).³⁰ This does not only affect interested players who seek to profit from it or bring along a professional bias, but (unfortunately) also diagnoses of the times from the social sciences. These proclaim a new digital age, a new era or epoch. Capitalism now gets the additional designation “digital” (Nachtwey/Staab 2020; Staab/Butollo 2018) or is flagged as “platform capitalism” (Srnicek 2018). On the one hand, this is premature, as one has to believe too much of what has been promised and imagined for the future. Instead, we should continue to expect future phases in which a different meaning and relevance is given to digitalization. On the other hand, the innovations that have been particularly singled out, such as Internet platforms or spectacular AI applications, only highlight partial developments and are thus highly selective. Finally, compact diagnoses such as “digital capitalism” share the general deficit of contemporary diagnoses that stylize certain aspects as defining characteristics of contemporary societies (Faust/Kädtler 2018). Such partial labels have followed one another too quickly in recent decades: Hasn’t there just been “financial market capitalism”? Such kinds of compact and simultaneously selective terms also promote monocausal explanations of social and organizational change. The main characteristics of contemporary societies highlighted in such analyses thus mutate erroneously into the main causes of changes in the economy, companies and work.

The absolutization of digitalization as a means leads to too little deliberation in social debates about the purposes themselves and how they might be achieved. More and faster digitalization always seems to be the right thing to do: Digitalization as a solution in search of problems – as a well-known *bon mot* goes. The means-ends schema may encourage a more reasoned debate. If one starts with certain ends in mind – “sustainable” mobility, for instance - then one can think through by what means and in which ways they can be achieved. In this process of thinking things through, it may emerge that digitalization can also play a role in a specific way, alongside other (possibly more important) means and paths. Will autonomous driving, the supreme discipline of AI, then be one of them? Doing so, priorities which projects should be promoted and financed, can be set anew. Making digitalization an end in itself can only be a hindrance in this process.

³⁰ More recent accounts (August 2024) give some indications that more and more observers do not believe anymore in the efficacy and the financial returns of the current AI applications. However, it is too early to come to a clear conclusion.

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