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Research Article

Digital Innopreneurship 1: The Basics of Collaboration Between Corporates and Startups in the Digital Economy

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Abstract

From an overall perspective, digitalisation is generally determined by two main trends: Firstly, digital innovations, which are usually developed and brought to market by small startups in the form of new digital technologies or new digital business processes and models. The second is Digital Transformation, which usually involves large corporates digitising their existing technologies or existing business processes and models (although this can also be done innovatively). The question now, however, is how these two trends can be combined to create a new force for digital progress that would benefit both startups and corporates from a macroeconomic perspective. In this respect, the term "Digital Innopreneurship" describes the creation of a joint Digital-Innovation-Capability and Digital-Transformation-Capability of startups and corporates, which is made up of the Digital-Innovation-Strength of startups (Digital Entrepreneurship), the Digital-Transformation-Strength of corporates (Digital Intrapreneurship) and the Digital-Synergy-Strength (Digital Interpreneurship) between these two players. This article (Part 1) is intended to illustrate this and describe the potential for cooperation, while the following article (Part 2) will focus on the evaluation of cooperation.

Keywords

Digital Business, Digital Entrepreneurship, Digital Intrapreneurship, Digital Interpreneurship, Digital Innopreneurship

1. Capability of Digitalisation as an Economic Factor

Digitalisation is one of the most important economic issues worldwide [1, 2]. According to IMD [3], for example, the World Digital Competitiveness Ranking analyses and evaluates the ability of countries to introduce and explore digital technologies that lead to a transformation of government practices, business models and society in general. Digital competitiveness is assessed based on three main criteria: Knowledge, technology and sustainability [3]. This ranking is currently led by Singapore, ahead of Switzerland and Denmark. The USA is in 4th place, China is in 14th place, and an industrialised nation like Germany is only in 23rd place. Digital Transformation plays a decisive role in the ranking, with the last point explicitly "taking place primarily at enterprise level" [3], p. 50. This, therefore, mainly addresses the ability of large established companies (corporates) to undergo Digital Transformation.

On the other hand, the Global Entrepreneurship Monitor [4] analyses the (digital) innovative strength that startups with associated entrepreneurship are unleashing. Entrepreneurship is "a formidable engine of economic growth. It promotes the

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essential innovation required not only to exploit new opportunities, promote productivity and create employment but also to address some of society's greatest challenges." [4], p. 15. Against this backdrop, many country-specific startup studies also show that the topic of "digitalisation" is one of the key areas of employment for startups (e.g. Germany - German Startup Monitor; [5]). The Global Startup Ecosystem Report 2024 [6] provides a good overview of the global activities of startups: Here, too, the areas of "FinTech", "AI", "Robotics", "Information Technologies", etc. are seen to take centre stage.

Against this backdrop, the GEM [4], p. 17 concludes that "the highest levels of entrepreneurial activity are in the Latin America & Caribbean region, with all five highest rates of adults starting and running new businesses coming from this region." There is also much catching up to do here in terms of digitalisation. However, countries such as Saudi Arabia, Canada, the USA, Chile and Thailand also have a high total early-stage entrepreneurial activity value (TEA; [4], p. 46). The GSER [6] sees the startup regions of Silicon Valley (USA), London (UK), Tel Aviv (Israel) and Singapore in particular in the lead. Of course, this does not yet indicate how successful and sustainable these activities are. The value of Established Business Ownership (EBO) is worth looking at.

In contrast to the TEA value, which focuses on entrepreneurship activity in the first 42 months, the EBO value looks at the time after that and, therefore, at the more established entrepreneurial activities. Countries such as Saudi Arabia, Korea and Ecuador score highly here [4], p. 46. It is now interesting to look at the combination of TEA and EBO values, as this shows where the ratio of young startup and established scaleup activities is equally weak. This includes Germany, China, France, the UK and Italy [4], p. 47. Furthermore, it is striking what else these countries have in common: They are all among the largest industrialised countries in the world. Suppose we exclude China as a "special case". In that case, we can also see that the digital domestic market of these countries is too small to develop their own digital startup activities with global relevance and that this field is more likely to be occupied by platforms from the USA. At the same time, it can be observed that the large (industrial) corporates in these countries have (not) been able to build up their competitiveness in the digital sector according to the IMD [3].

This results in a double dilemma for these countries, which are mainly located in Europe, between a lack of Digital-Transformation-Strength via corporates and a lack of Digital-Innovation-Strength via startups. However, in all other countries (which are better positioned in terms of digitalisation), the intensification of corporate-startup-collaboration can also secure or even increase competitiveness for the future. This gives rise to the following research questions, which are of interest to all countries, especially if they want to keep up in the upcoming race for artificial intelligence:

1. How can established corporates master the task of Digital Transformation in order to secure their competitiveness in the area of digitalisation?
2. How can new startups be created that develop digital innovations and thus contribute to economic growth in the future?
3. How can and should established corporations and young startups cooperate to build joint competitiveness in the digital economy?

1.1. Digital Transformation

With their underlying platforms and business models, digital economy companies have significantly shaped economic and social development in recent years [7, 8]. Real-world retailers must fight for survival against Amazon; car manufacturers must defend their position against Tesla, Waymo or Uber; banks must prevent the loss of their customers to PayPal/Google/Apple; and machine manufacturers must make their products intelligent [9]. No matter what strategy the companies are currently pursuing, they all have noticeably increased their digitalisation tempo in the past year and spent more money on it [10]. Many of the world's most valuable companies are so-called "pure digital players", i.e., purely digitally oriented companies with their own exclusively digital value creation processes (e.g., Google, Facebook, or Alibaba).

In addition to the economic and geopolitical structures in the real world, digital economic spaces have also formed against this backdrop in the course of the networked age, but these have completely different rules of the game [11, 12]. While in reality, suppliers and consumers can be assigned to a specific location with the associated real resources, the global network is virtual and literally borderless. This applies to users and the data from which digital value creation results [2, 13]. Thus, the associated economic power from the data is defined not only by the associated network and scaling effects of the platform economy but also by the associated framework conditions of the 3-R-Factors in digital competition: relevance, reach and response [14], p. 203 f.:

1. Relevance: Who can offer relevant added value for users or participants with their digital offering or digital platform? Moreover, how can you permanently address this relevant added value for a specific topic or process? How can you use this relevant added value via an associated content value proposition to retain customers faster and better than the competition?
2. Reach: Who reaches the critical mass of users or participants for their offer or platform, how quickly and how well? Moreover, who generates the most and best network and scaling effects with lock-in scenarios for their customers from this critical mass? Who converts the resulting data volumes into an associated economic business model?
3. Reaction: Based on the associated analysis, who can best calculate the trends, needs, intentions, and actions of the users or participants using the data quantity/quality? Moreover, who will be able to act and react faster and better than the competition based on the associated customer insights?

Traditional companies do not always have the right answers to these questions [15]. In addition, there is often a lack of an associated, comprehensive and consistent "Digital Transformation" of real business models and processes in the overarching corporate strategy [16, 17]. Studies from an industrialised country such as Germany, for example, show that only a good third of companies there have a cross-divisional digital strategy [15]. Around the same number of companies have developed digital strategies, at least in individual areas. However, almost one in four German companies still do not have a digital strategy despite the digital competition [18]. Against this backdrop, an associated Digital Transformation can be defined as follows [9], p. 2:

> *Digital Transformation (also known as "digital change") refers to an ongoing and far-reaching process of change for society, business, and politics based on digital technologies, which fundamentally influences information, communication and transactions between the players involved and leads to a new understanding and behaviour in social, economic and political areas of life.*

Digital Transformation has become a common buzzword in the recent past. In this context, digital technologies such as artificial intelligence (AI), big data, blockchain, cloud services and sensor technology are repeatedly considered drivers of digital change [19, 20]. Accordingly, knowledge in the areas of robotics, human-machine interaction, data analytics, IT security and data protection is playing an increasingly central role. However, sensors, the Internet of Things (IoT), AI, and remote maintenance, along with the associated digitalisation of products, will also play an increasingly important role. However, the development of associated digital platforms should also not be overlooked. These have proven to be a superior business model online [13]. Against this backdrop, it is not only the products that are changing but also the associated services and retail services that will become more important in the future. Both areas must increasingly include digital value creation. This requires entrepreneurs and employees to have a new understanding and associated skills for developing digital business models [21].

Automating processes is a simple necessity, as is answering related questions such as digital customer journeys, dynamic pricing, interactive ordering, tracking, etc. Based on this 3-P-Model [9], p. 4 f. for a Digital Transformation with processes, products and platforms, there is an urgent need to consider the following approaches in particular:

1. Digital Processes: Digitising and automating existing business processes and developing an associated digital system and database to improve efficiency and effectiveness in current information, communication, and transaction processes for existing and known business activities.
2. Digital Products: Digitising and supplementing existing products and services with digital added value by developing new online products and services based on data.
3. Digital Platforms: Development of associated or even new digital market and customer platforms to cover upstream or downstream trading processes or as a link to investment and cooperation partners.

Against this backdrop, companies in all sectors, business models and markets are affected by digital change and cannot escape it. Due to the increasing complexity and the speed at which market environments are changing, it is particularly important for today's companies to strike a balance between existing and new business areas to remain competitive in the long term. Christensen [22] already described a similar problem in the context of the "innovation dilemma", namely that companies are often unable to devote themselves to technological innovations because they focus too much on optimising existing business areas. As a result, almost two-thirds of companies currently see themselves as competitive in terms of their core business in the future, but only a good third of respondents rate their company as competitive in terms of new business areas and topics [23].

Against this backdrop, managers, in particular, must steer their companies about changing market conditions and define strategic guidelines. They must be in a position [19, 9, 24] to maintain the efficiency of the (real) existing or core business (exploitation) on the one hand and to promote the agility and adaptability of the (digital) innovation business (exploration) on the other. The compatibility of these two aspects in a balanced relationship with the aim of ensuring the necessary ability to act, especially in the context of Digital Transformation, can be described as Digital Ambidexterity [25] and [9], p. 32 ff.

1.2. Digital Innovation

Technological progress and the spread of digital technologies radically influence the development of innovative market offerings, business processes and models [26, 27]. The use of these advancing digital technologies, such as AI, big data analytics or cloud computing, opens up a wide range of business opportunities [28], which, as already mentioned above, can be divided into exploitation and exploration [24]. Exploitation here includes, in particular, the refinement and improvement of existing entrepreneurial processes, routines and structures [29, 19]. The result is often "only" a more or less familiar digital automation of existing processes. Exploration, on the other hand, involves the creation of space and time to enable the innovation process in the context of finding ideas and solutions [30, 19]. The result should be new digital business models.

According to Nambisan [1], digital technologies have led to two significant changes in companies. Firstly, the previously discrete, impenetrable and stable corporate boundaries have become increasingly blurred and fluid. Secondly, the locus of entrepreneurial activity - i.e., where the capabilities are located to gather entrepreneurial ideas and resources to develop them - is also less predefined. There is no longer just one focal

actor in the innovation process but a dynamic collection of many actors (inside and outside the company). As a result of these changes, new innovation collectives are increasingly being formed, consisting of dynamic actors with different goals and skills [31].

In order to clearly understand the relevance of innovation and its relationship to the digital economy, a distinction must again be made between invention and innovation. Schumpeter - as one of the fathers of innovation research - identified innovation as the implementation of new combinations into reality and thus as the essential function of the entrepreneur: "the doing of new things or the doing of things that are already done, in a new way" [32], p. 151, whereby he assumes the first-time realisation of innovation. Innovations are, therefore, new or different combinations of available resources and processes [33]. Invention, on the other hand, is often based on spontaneous ideas and inspirational knowledge for new business areas [34]. Schumpeter does not see any economically relevant effect in invention here: "Innovation is possible without anything we should identify as invention and invention does not necessarily induce innovation, but produces of itself [...] no economically relevant effect at all" [35], p. 84.

The potentially disruptive impact that Digital Transformation can have on innovation becomes apparent when you look again at the changes in the ranking of the world's largest listed companies in recent years. Companies such as the Digital Big-5 - i.e. Google, Amazon, Facebook, Apple and Microsoft as the five most prominent IT companies in the world - are now using a variety of digital technologies to drive innovation, allowing them greater scalability, broader market scope and faster strategic action [2]. History is repeating itself, as the artificial intelligence market is also being driven by both new innovative and disruptive players such as OpenAI, as well as the Digital Big 5, such as Google with Gemini. Against this backdrop, an associated digital innovation can be defined as follows:

> *A Digital Innovation is the introduction of new or significantly improved products/services, processes or platforms with or without associated digital business models that are (only) based on or (only) enabled by digital technologies or digital tools.*

While innovations used to be created in a direct competitive environment, today, they are often generated by companies from outside the industry [36, 37]. As a result, the creation of radical ideas increasingly requires a broad range of knowledge that cannot be covered solely within the company. Open innovation offers the opportunity to involve customers, research institutions or other companies in the innovation process [38, 39]. The risk of an innovative product can be countered by using partnerships to better assess how the desirable can be combined with the feasible [40, 1]. Digital Transformation, therefore, affects all companies - but especially the world of startups, which are increasingly acting as drivers and can inspire and drive established organisations to change and take advantage of the opportunities of Digital Transformation in a win-win approach. Open innovation, therefore, also favours collaboration between startups and companies: The former have access to more capital and technology, are faster and more innovative, can enter the market more efficiently and acquire references; the latter still have access to the markets, can utilise the startup's research and development activities, diversify the business and test the new digital product or service more easily before launching it on the market.

Digital-Innovation-Capability is therefore addressed, in particular by startups alone [26]. They change established industries or develop completely new business models [41]. Many services that we use today, as a matter of course, did not even exist a few years ago. Startups are, therefore, important drivers of the further development of an economy. Through their innovative products, services and business models or processes - especially in connection with digitalisation - they create economic and social progress as well as jobs in attractive areas and industries [42, 43]. Against this backdrop, startups are a significant economic factor for an economy and one of the main sources of digital innovations, through which they can enter the market particularly easily [27]. However, this makes it all the more difficult for them to assert themselves against the enormous (national and international) digital competition and to finance their own launch and subsequent growth.

2. Capability of Digital Innovation as a Competitive Factor

Summarising the previous descriptions, three sources or areas for Digital-Innovation-Capability can now be identified. Firstly, there is the need for digital innovations within existing companies to support the Digital Transformation. Secondly, there is the opportunity for startups to use digital innovations as a starting point for their own development into larger companies. Finally, there is a combination of these two areas for the joint development of digital innovations between large or medium-sized established companies and small startups. Against this backdrop, the key question is, therefore, where and how the associated digital innovations are developed within and for the 3-P-Model (processes, products and platforms) and who is responsible for this. The answer can once again be summarised in the following three areas [44], p. 46:

1. Digital-Transformation-Strength of existing companies (corporates/SMEs/family businesses) through the innovative use of digital technologies to adapt and expand existing ones and to develop new business models and processes derivatively or independently for digital competition (aspect: Digital Intrapreneurship).
2. Digital-Innovation-Strength of new companies (startups) through the innovative use of digital technologies for the original or independent development of new business

models and processes for digital competition (aspect: Digital Entrepreneurship).

3. Digital-Synergy-Strength between existing (corporates/ SMEs/family businesses) and new companies (startups) for the joint development and operation (cooperation, spin-offs, etc.) of digital technologies for the original or derivative or dependent or independent development of new business models and processes for digital competition (aspect: Digital Interpreneurship).

Accordingly, from all perspectives, there is a need, but also an opportunity, to launch new digital processes, products and platforms or to transform existing processes, products and platforms digitally. In addition, new and, as yet, untested methods for marketing them via digital business models can be tested, digital markets can be developed, and new structures and positioning can be created within the framework of the new digital platform economy. Then - and only then - will the necessary melting pot for Digital Transformation with and via digital innovations be created for the economy as a whole. Against this backdrop, the combination of Digital Intrapreneurship, Digital Entrepreneurship and Digital Interpreneurship also defines the new concept of Digital Innopreneurship. In order to specify this, the individual components in the form of Digital-Transformation-Strength (Digital Intrapreneurship), Digital-Innovation-Strength (Digital Entrepreneurship) and Digital-Synergy-Strength (Digital Interpreneurship) must first be recapitulated. The connecting element for all these forces towards Digital Innopreneurship is the Digital-Innovation-Capability of the players involved, from startups to SMEs and industry, which needs to be broken down here. The resulting definition of the term "Digital Innopreneurship" is then clarified by linking the individual elements.

2.1. Digital Intrapreneurship About Corporates

The aim of “Digital Intrapreneurship” is to support an organisation's existing employees in developing and scaling their own digital ideas [45, 46]. The term was first mentioned by Gifford Pinchot [47], who defined intrapreneurs in general terms as dreamers who take action and assume responsibility for developing innovations of all kinds within companies. Intrapreneurship as a bottom-up approach, therefore, focuses on the employees themselves as creative individuals who want to develop new ideas and thus also their company and drive innovation [48]. Intrapreneurs operate at the edges of the organisation in order to expand existing products, services and technologies and thus increase diversification, develop new company potential and promote disruption [49, 50]. This approach differs from the structured research and development activities at the core of an organisation with regard to the further development of the current core business (inside-the-box thinking), precisely in the development of potential at the disruptive edge of an organisation (out-of-the-box thinking) for the future innovation business. Established companies, in particular, should also draw on their own resources, which they often overlook in their search for innovations [51]. Intrapreneurship and, in relation to digitalisation, Digital Intrapreneurship thus describe internal entrepreneurship, in which every employee is allowed to drive forward their own (digital) ideas within an established company through the targeted promotion of entrepreneurial behaviour, which can generate new business and strengthen the company's innovative capacity as well as increase employee satisfaction [52].

Digital Intrapreneurship is, therefore, characterised by the fact that digital innovation originates from the company itself and is not created through external acquisitions or collaborations [52]. On the contrary, intrapreneurship initiatives are organised as autonomous units within an existing company in which new business is to be generated. They are integrated into the company's structures, and the ownership of the innovation usually lies with the parent company [53]. However, the resulting digital venture can be legally separated from the parent company [26]. In addition to increased Digital-Innovation-Capability, Digital Intrapreneurship offers further advantages for diverse stakeholders. For example, the questioning and adaptation of corporate values and methods can lead to a digital revitalisation of the organisation [52, 54]. This, in turn, leads to increased employee motivation, promotes organisational and individual learning with and about digital skills, creates a better climate and enables processes to become more dynamic [9]. In addition, unused resources can be better utilised and an increase in economic performance can be achieved [51].

Due to the fundamental influence of digital technologies and the associated shifts in the innovation process, existing innovation and organisational theories are in a transitional phase [55] or Digital Transformation. Against this backdrop, the relevance of the development of digital innovations compared to analogue innovations continues to increase [28]. Emerging technologies such as the IoT, AI, machine learning (ML), robotics and blockchain are constantly opening up new opportunities [26]. Although the Digital Transformation is currently impacting a large number of companies, little attention is being paid to the role of Digital Intrapreneurship - especially in traditional industries. Established companies, in particular, must learn to adapt to their environment, as it is no longer sustainable to rely solely on the tried and tested. On the other hand, research emphasises that it is also not a question of replacing everything that is tried and tested [56, 57]. Instead, the focus should be on being open and flexible in the face of change [31]. For example, the IoT supports tracking quality, ownership histories or the social and environmental aspects within supply chains. AI enables users to process vast amounts of consumer data derived from various customer interactions to gain new and improved customer-centric insights that are useful for ideation, advertising, monitoring and the invention process [19, 58]. ML, on the other hand, potentially reduces the cost of predictions and problem diagnoses that become relevant in various business decisions [13]. The innovative use of digital technologies to adapt and expand

existing business models and processes to digital competition is therefore essential for companies in every industry and sector in order to drive (digital) transformation [41, 59, 2].

Against this background, the concept of Digital Intrapreneurship is defined on the one hand by the use of digital means and on the other with regard to the digital result. This includes any form that uses digital means as a decisive component to support the innovation initiative [52] or it can also be the digital innovation itself as a new digital product or a new digital service [26]. However, the use of existing digital technology and its integration into existing business models and processes are also fundamental to being able to do business better, cheaper and faster. This type of innovation is the most important form of digital innovation for companies in traditional industries. For them, digital innovation is not always about genuinely new digital products or services, but rather about new and better ways of digital marketing, digital customer relationships, automated operational efficiency and the use of digital technologies to make current products and services better and processes faster and more cost-effective [52]. Digital Intrapreneurship often offers the potential for particularly simple innovation opportunities that can bring about major changes on the basis of a small investment. To do this, however, a company should not only focus on promoting commercial growth but also create the right corporate culture and a safe and supportive environment for its digital intrapreneurs.

Against this backdrop, the Digital Transformation of an economy presents existing companies with particular challenges in terms of Digital Transformation, which is why Digital Intrapreneurship is an essential measure for utilising creativity, diversity and disruption within the company as a basis for digital innovations. Against this backdrop, Digital Intrapreneurship can be defined as follows [26], p. 21:

> *"Digital Intrapreneurship" describes both the innovative use of digital technologies to adapt and expand existing business models and processes to digital competition and the derivative or independent development of new digital innovations as the basis for future digital business models and processes by entrepreneurial employees for the benefit of their employer.*

2.2. Digital Entrepreneurship About Startups

As part of Digital Entrepreneurship, "founders should establish a new and independent company (so-called startup) on the basis of an innovative digital idea" [26], p. 21. At this point, however, it must be noted that several recent studies mistakenly regard “Digital Entrepreneurship” as a newly emerging field [60-62]. In so doing, these contributions neglect previous research contributions on this topic, which clearly laid the foundation for all subsequent considerations and discussions [27, 63]. Thus, the assumption that the research field of “Digital Entrepreneurship” is a new phenomenon must be disagreed with, and Kollmann et al. [27] also demonstrate this through a content-related literature analysis by tracing the roots, definitions and content of “Digital Entrepreneurship” back to the terms used much earlier, such as "E-Entrepreneurship", "Internet Entrepreneurship" or "Technopreneurship". The content has remained the same, and yet some authors – e.g. Kraus et al. [64] or Fernandes et al. [65] still try to position “Digital Entrepreneurship” knowingly or unknowingly as a “new discipline”, which is not true.

Irrespective of this, startups in this field play an outstanding role in the social and economic development of a country. The background to this is the fact that every startup creates a new market participant that has a stimulating effect on digital competition and thus further drives economic dynamism [26]. The new company demands certain resources on the market (e.g. labour and materials) and - after using these resources in internal production and work processes - in turn offers its digital products or digital services to the market as a result. This core principle ensures the functionality of a (digital) economy.

In principle, the type of business startup is not tied to a specific industry and is, therefore, initially neutral in terms of the field of application. However, the degree of innovation with regard to the business concept is a decisive factor, particularly with regard to digitalisation [26]. In this respect, Nathusius [66] distinguishes between an innovative and an imitative startup. An innovative startup is one in which there is a new combination of input factors in the classic Schumpeterian sense [67]. This new combination can relate to material or immaterial factors. Intangible factors, in particular (e.g. knowledge, expertise), have become increasingly important recently. For example, many startups in the digital sector are based on new knowledge-based and conceptual-creative factors. In the digital economy, in particular, there is a high potential for disruptive innovations based on information-processing processes with digital "zeros and ones" [26] due to the special features of digital value creation and the associated digital goods and services. This is due, in particular, to the fact that there is extensive independence from material resources and the production, transaction and consumption of digital offerings based on "zeros and ones" exchanged between computers works very quickly and cost-effectively [68]. The procurement, processing and transfer of digital goods or services is no longer linked to the availability of more or less large real resources.

In addition to a product with digital value creation, the establishment of a company in the digital economy also requires management with specific knowledge of the interrelationships in the network economy in order to ensure operations [26]. This is particularly important in view of the fact that the information and, thus, the basis for value-creation activities in digital data networks can change very quickly. In addition to the digital value chain, another special feature of the digital economy is that it is a very dynamic field of activity in which many years of experience are not always relevant. Accordingly, digital value creation and the company based on it are

orientated in particular towards future developments [69]. Furthermore, with regard to the use of innovative information technologies (e.g. the use of digital purchasing by Internet startups), there is a high degree of uncertainty about the extent and timing of acceptance [70] on the customer side. The circumstances outlined above result in a high risk with regard to developments in the digital economy and, therefore, also for the corresponding investments in this area.

Furthermore, investment in information technologies is still at a high level, which highlights two aspects: Firstly, information technologies require a certain amount of capital for initial development and/or operation, and secondly, information technologies are subject to constant change/further development and thus require follow-up investments [71]. In addition to the capital requirement for the technology, further startup investments are necessary when founding a company in the digital economy (e.g. personnel, organisation, brand development, sales, production). Together with the development of information technology and the information economy, the framework conditions for setting up a business in the digital economy, for which the overarching term "Digital Entrepreneurship" can be used, can be described [26]. The focus is on the young company in the digital economy, which has also been introduced into the literature as a research object under the term "digital startup" or "digital venture" [26], p. 25.

The Digital Transformation of an economy represents a special opportunity for new companies in the context of Digital Transformation, which is why Digital Entrepreneurship is an essential measure for utilising creativity, diversity and disruption for digital innovations as a basis for setting up a company [28, 72]. As early as 2006, Kollmann [73], p. 333 speaks of "establishing a new company with an innovative business idea within the net [digital] economy, which, using an electronic [digital] platform in data networks, offers its products and/or services based upon a purely electronic [digital] creation of value. Essential is the fact that this value offer was only made possible through the development of information technology." Against this background, Digital Entrepreneurship can be defined as follows [26], p. 25:

> *"Digital Entrepreneurship is understood to mean the creation of an independent and original legal business entity in the digital economy (digital venture) within which the independent founder(s) wants to meet a third-party need with a specific online offering (product or service)."*

2.3. Digital Interpreneurship About Corporates and Startups

Within the framework of Digital Interpreneurship, startups, SMEs, and the industry should work together with a view to joint Digital-Innovation-Capability [74, 75]. A startup and an established company are two organisational forms that could not be more different at first glance [53] - especially with regard to Digital Transformation. Startups - i.e. companies that are younger than 10 years, innovative and/or growth-oriented [5] - often focus their business models on the novel utilisation of digital information [26]. With their innovative strength, agility, willingness to take risks and strive for growth, they want to make the best possible use of the advantages of digital technologies [76]. However, to successfully realise their ambitions, startups must overcome their disadvantages in terms of size and age, such as a lack of capital, experience and knowledge [77]. The major advantage on the part of startups is undoubtedly their innovative strength. Startups are generally best placed to recombine their own expertise in order to develop technically innovative solutions or creative business models for existing problems [78]. Their drive is to develop new solutions for the market and thus become successful. As a result, they remarkably often produce innovations with enormous potential [21]. Their small size and young age also enable startups to operate flexibly and without the hindrance of established hierarchies and bureaucratic hurdles [79].

At the same time, established companies - i.e. companies that are more than ten years old, have already reached a certain size and have established themselves in at least one market segment - are under increasing pressure to implement advanced digital technologies in order to innovate and transform existing business models, despite their supposed strengths (such as financial resources and experience, [80]). Radical digital innovations, in particular, often lead to established companies that stick to their practices being displaced by more innovative competitors [33]. This illustrates the discrepancy between the requirements of increasingly digitalised business areas and the organisational capabilities to meet these challenges [80].

Developing new approaches, reacting to current challenges and being at the forefront of progress - these are all goals that established companies also strive for alongside startups. However, startups have the advantage of being unbound, unbound by a brand, customer expectations and cumbersome processes. Older companies are also often risk-averse. This is because conquering a new market segment could jeopardise the core business or damage the company's image if it fails [33]. Against this backdrop, the area of innovation-promoting collaborations between startups and established companies is attracting increasing attention [81]. For example, the study results of the German Startup Monitor 2023 show that many of the startups surveyed (61.4%) cooperate with established companies [5], p. 47. Startups will also become a clear focus of established companies as a source of innovation in the future. According to a study by MIT and Capgemini Invent, a significant part of the expansion of innovation procurement has occurred in the last five years, which can be explained by the increasing importance of Digital Transformation [82].

However, it is not only long-established companies that can benefit from collaboration. Collaboration with an experienced company can also be worthwhile for a startup in many respects [83, 84]. Experience, entrepreneurial expertise and industry knowledge can support startups in their development

and promote their growth. Startups are often supported in their cooperation with financial means and other resources, such as office space or the shared use of machines, data and processes. The support can be specifically intended for a joint project or be kept general to promote further innovation [85]. This can also reduce dependence on (further) external capital. In the course of the cooperation, startups often also come into contact with customers, benefit from the experience and industry knowledge of the established company and receive references for future projects [86, 87]. However, exactly which accesses are available always depends on the cooperation. Thanks to the experience of the cooperation partner, the startup can learn from practices in many areas and thus better plan its own growth and internationalisation [88].

Especially in a dynamic and fast-moving environment such as the highly digitalised information and communication industry, this agility enables an immediate response to external changes [26]. The successful development of digital innovations, which are typically associated with great uncertainties due to their novelty and uncertainty [79], always requires a certain degree of willingness to take risks. Startups are often willing to take this risk despite a relatively high probability of failure [27]. In addition, pursuing growth often enables young companies to grow beyond perceived capacity limits by combining low-cost resources in new ways [78]. Startups are, therefore, not only providers of ideas but also drivers of ideas and have methods and ways of working from which established companies can benefit [53].

The aspects of product complexity and high market uncertainty, in particular, characterise the digital economy and thus underline the need for corresponding openness towards possible partnerships in this area in order to reduce one's own risk [89]. This partnership policy has already shown several times in history that the potential of startups with regard to their disruptive technological innovations often only materialises when they are supported by a cooperation/collaboration with leading big players (e.g. IBM, Kodak or HP; [2]). Through cooperation, startups and established companies can thus form an innovation collective [94]. A cooperation/collaboration describes voluntarily coordinated measures between partners that serve to achieve jointly agreed goals. Such a collective enables the successful development of digital innovations by combining the strengths and compensating for the weaknesses of the individual partners [77, 5]. "Cooperations with those who practice prototypical entrepreneurship, therefore, appear to be an interesting, further instrument of corporate entrepreneurship - established companies are therefore striving to cooperate more often with startups" [1].

The Digital Transformation of an economy presents existing and new companies with particular challenges in terms of Digital Transformation, which is why Digital Interpreneurship is an essential measure for utilising the creativity, diversity and disruption between startups, SMEs and industry as a basis for digital innovations. Against this background, Digital Interpreneurship can be defined as follows [26], p. 29:

"Digital Interpreneurship" describes the cooperation/collaboration of existing companies (corporates/SMEs/family businesses) with new companies (startups) with regard to digital innovations for the derivative or dependent adaptation and expansion of existing or the development of original or independent and thus new digital business models and processes for digital competition through the mutual contribution of complementary resources.

3. Digital Collaboration as a Success Factor

Nowadays, innovation and digitalisation can no longer be understood as individual components of successful entrepreneurship [90, 43]. The overlaps are manifold, so it is now difficult to distinguish between the concepts. Innovation is often seen as digitalisation and vice versa. It is essential to note here that innovation without digitalisation is becoming increasingly rare in the digital age. Likewise, digitalisation without innovation is rarely truly sustainable [28]. It should be noted here that innovation itself often only has a minor impact on company structures and work processes. A new production line is opened for an innovative product, but production itself rarely changes. In order to occupy a new market segment, new sales structures are established, but the sales organisation itself does not change fundamentally. Moreover, even with process innovations, the basic process often remains the same - only optimised [91, 2, 80]. Digitalisation, on the other hand, affects the entire company. All workflows and processes within companies are gradually being transferred to digital workflows and thus rethought or even optimised. However, companies are using innovative technologies such as digital communication tools, AI or the IoT to develop new processes and offerings based on data. The transformation thus affects all departments of existing companies (corporates/SMEs/family businesses) as well as new companies (startups) and, therefore, the entire economy [26].

Digitalisation is, therefore, able to establish innovations throughout the entire company and emphasise their relevance, as standing still in a business context always means taking a step backwards. Accordingly, there is a need to launch new digital products and processes or to digitally transform existing products and processes, to test new and therefore as yet untested methods for marketing them via digital business models, to develop digital markets, and even to create new structures and positioning within the new digital platform economy. In this task, startups, as well as SMEs and corporates, stand side by side and can address the associated goals of a Digital Transformation of the economy and society either separately or together. The different paths of Digital Intrapreneurship, Digital Entrepreneurship and Digital Interpreneurship point to a new nucleus when combined: Digital Innopreneurship!

3.1. Fundamentals of Digital Innopreneurship

According to the Competence Centre for Innovation and Entrepreneurship at the University of Duisburg-Essen, the acronym "Innopreneurship" - usually interpreted as a combination of innovation and entrepreneurship - describes the goal of promoting innovative entrepreneurship, outlining projects that open up new markets and value chains [92]. In the interpretation of this article, the definition of the term goes beyond this and is also more differentiated according to the various sources of an associated innovative capacity, especially for the area of digitalisation as the basis for the development of associated new digital business models and processes. Here, startups, SMEs and industry are added as the key players and their objectives with regard to innovation development specifically for Digital Transformation. Accordingly, the term "Digital Innopreneurship" can be described as follows:

> *The term "Digital Innopreneurship" refers to the creation of a Digital-Innovation-Capability of the players involved from startups, SMEs and corporates, which is made up of the Digital-Transformation-Strength (Digital Intrapreneurship), the Digital-Innovation-Strength (Digital Entrepreneurship) and the Digital-Synergy-Strength (Digital Interpreneurship) of these players.*

The individual measures under which Digital Innopreneurship is considered in the respective sectors are initially of secondary importance. Rather, this is an umbrella term that addresses all activities for the Digital-Innovation-Capability of the actors involved at the various levels. The more or less familiar disciplines of Intrapreneurship, Entrepreneurship and Interpreneurship are combined in the nucleus of digitalisation to form an overall discipline for the Digital-Innovation-Capability of an economy as an umbrella term. Various axes are considered in connection with the actors involved (see Figure 1). Firstly, the axis of a "Digital Transformation" with the sub-categories of a "Digital Transformation" for corporates, SMEs and industry, a "digital innovation" with reference to startups and a "digital synergy" with cooperation between startups, SMEs and industry. The resulting "digitalisation of old business models/processes" requires the digitalisation, modernisation or automation of business models and processes that already exist on the basis of an associated Digital-Innovation-Capability. This Digital-Innovation-Capability also determines the second axis in which this capability requires "Digital Intrapreneurship" from the perspective of corporates, SMEs and industry, while startups address "Digital Entrepreneurship" for this purpose. The bringing together of both groups with regard to the formation of a joint Digital-Innovation-Capability is motivated by "Digital Interpreneurship". All three areas together result or are formed by "Digital Innopreneurship", which in turn describes the entire Digital-Innovation-Capability as a Digital Transformation, innovation and synergy force for the individual players and overall as an economic group with regard to the "digitalisation of new business models/processes" (see Figure 1).

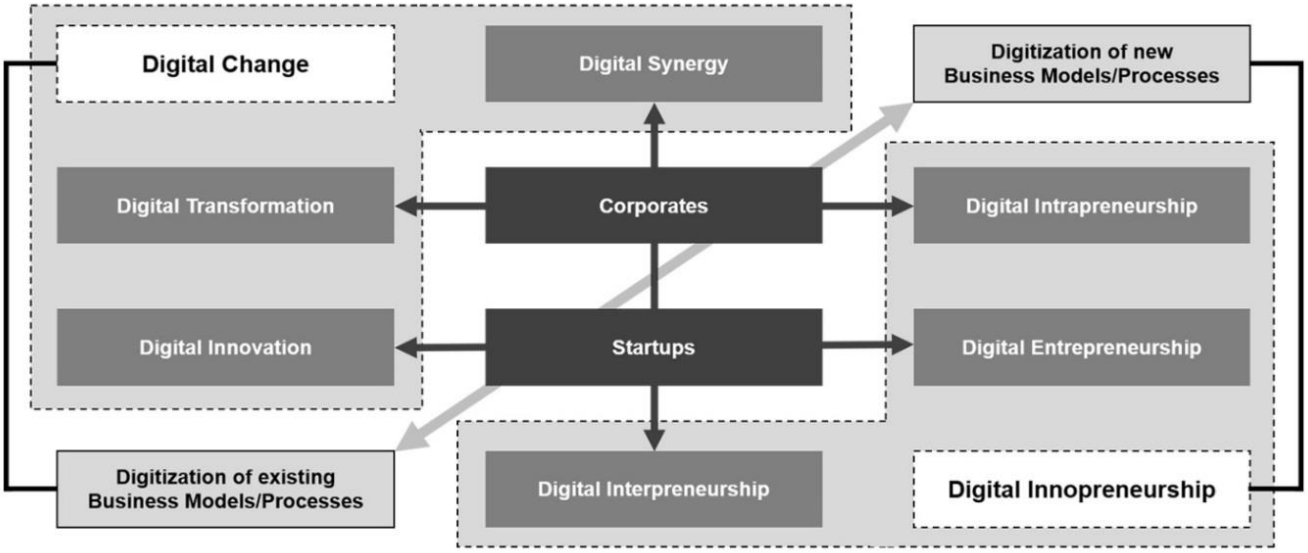

Figure 1. *The Basic Concept for a Digital Innopreneurship.*

Therefore, Digital Innopreneurship means adopting a new perspective and recognising, promoting and valuing entrepreneurial thinking among and for all stakeholders in individual and joint digital projects. This relates not only to the digital technologies themselves but also to the associated development and application knowledge and the digital expertise to implement this knowledge in (new) digital business processes and models. This requires corporates, SMEs and family businesses that want to "reinvent themselves digitally" on the one hand and startups that have "reinvented themselves

digitally" on the other. The focus is not only on the institutions but also on the people involved as innovators - that is an important point.

Against the backdrop of Digital Transformation, the specific characteristics of digital technologies enable innovators to more easily transform their associated digital business models and processes into new digital products, processes and platforms with the help of digital value creation based on "zeros and ones". Due to this particular type of digital change, Digital Innopreneurs have become extremely important and key players in this specific Digital-Transformation-Process. They combine the will (digital mindset), the ability (digital skills) and the doing (digital execution) as components of Digital Leadership [9]. This is independent of the type of company they work for and whether they operate in an independent and original (startups) or dependent and derivative (corporates, SMEs, industry) company structure. Not every Digital Innopreneur wants to risk founding their own company, and conversely, not every Digital Innopreneur wants to be trapped in a conservative corporate culture. The decisive factor will be that these innovators can develop their digital innovation skills in their respective environments, are supported, and, in the best case, can also network and collaborate across company hierarchies and boundaries.

Based on the considerations so far, three areas in particular need to be examined more closely regarding the framework conditions for Digital Innopreneurship:

1. Digital-Innovation-Capability: What skills or characteristics must an actor have in order to develop digital innovations and do these differ with regard to the business environment in which they work (startups, SMEs, family businesses, corporates)?
2. Digital-Innovation-Development: Which digital business models and processes are developed by the actors involved based on their specific digital innovation skills in which area?
3. Digital-Innovation-Culture: What framework conditions must be created in the respective corporate environment so that the actors involved can develop their digital innovation capabilities?

3.2. General Conditions of a Digital Innopreneurship

At the centre of a Digital Innopreneurship – as a connecting element of the individual perspectives into an overall perspective – is certainly the cooperation/collaboration between a corporation and a startup and thus a Digital Interpreneurship. However, a one-dimensional view or even equation of both terms or the associated aspects is not intended by the new approach of Digital Innopreneurship and is also highly dangerous for the joint success of both players. This becomes clear from the following observations from practice and findings from theory (see Figure 2):

1. Synergy potential on the product side: In a pure Interpreneurship (with or without investment/participation of the corporate in the startup), it is often observed that a corporate relies on the Digital-Innovation-Capability of a startup to compensate for its own lack of Digital-Innovation-Capability. However, this will only work to a limited extent and Digital Innopreneurship postulates the retention of Digital-Innovation-Capability on both sides (with Intrapreneurship and Entrepreneurship). This means that only if both partners continue to develop an independent Digital-Innovation-Capability will this also develop synergy potential on the product side as part of a joint cooperation.
2. Synergy potential on the market side: In a pure Interpreneurship (often with investment/participation of the corporate in the startup), it can often be observed that a startup voluntarily becomes solely dependent on a coorporate or is forced to do so by the latter due to protection from competition. This will also only work to a limited extent and Digital Innopreneurship postulates precisely the retention of market, development and competitive freedom for the startup and the corporate with regard to independent Digital-Innovation-Capability (with intrapreneurship and entrepreneurship). This means that only if both partners continue to give themselves the freedom and contractual leeway for the further development of an independent Digital-Innovation-Capability will this also develop synergy potential on the market side within the framework of a joint cooperation.
3. Synergy potential on the organisational side: In the case of pure Interpreneurship (with or without investment/participation of the corporate in the startup), it can often be observed that the organisational structures on the startup and corporate side cannot be dovetailed with each other and retain their respective decision-making structures and organisational cultures. This will also only work to a limited extent and Digital Entrepreneurship postulates precisely the mutual flexibility and acceptance to make these structures compatible (with intrapreneurship and entrepreneurship). This means that only if both partners harmonise the different speeds of the respective decision-making structures on both sides will a synergy potential unfold within the framework of a joint cooperation on the organisational side.
4. Synergy potential on the management side: In the case of pure Interpreneurship (with or without investment/participation of the corporate in the startup), it can often be observed that the actors on the startup and corporate side do not engage with each other and retain their respective management styles and cultures. This will also only work to a limited extent and Digital Innopreneurship postulates the mutual acceptance of managers with their different management styles (with intrapreneurship and entrepreneurship) without the abandonment of the respective management cultures on both sides. This means that only if both partners are able to cope with the respective man-

agement styles on the other side will a synergy potential unfold within the framework of joint cooperation on the management side.

5. Synergy potential on the investment side: In the case of pure Interpreneurship (often with investment/participation of the corporate in the startup), it can often be observed that the financing and exit strategies of the actors involved are not congruent. This will also only work to a limited extent, and Digital Entrepreneurship postulates the coordination of the respective framework conditions (e.g. investment agreement) and exit objectives (e.g. external IPO of the startup versus integration of the startup into the corporate organisation) with consideration of the respective perspectives (with intrapreneurship and entrepreneurship). This means that only if both partners are clear about the investment, the exit perspective, and act accordingly (venture behaviour) and have a common understanding in this regard, then there will be synergy potential developed on the investment side as part of a joint cooperation.

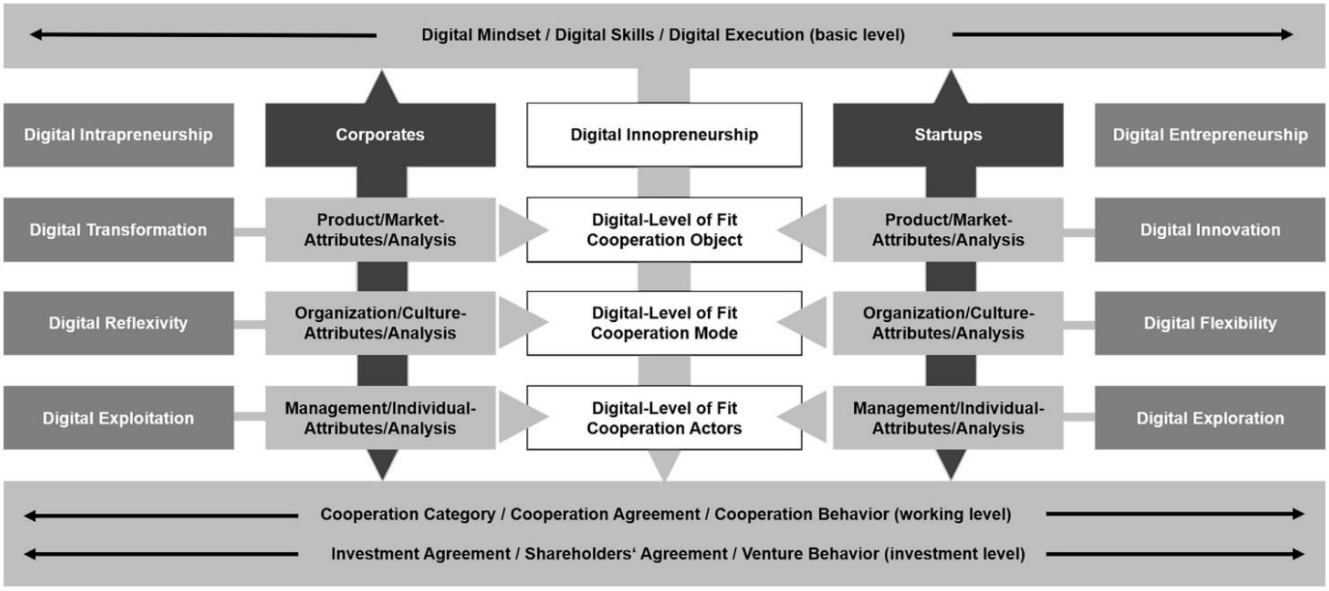

Figure 2. *The Framework Conditions for a Digital Innopreneurship.*

In order to enable successful Digital Innopreneurship, these framework conditions should/must be examined from both sides in advance of a collaboration between a corporate and a startup. The result (see Figure 2) is the consideration of a triad of Cooperation Object, Cooperation Mode and Cooperation Actors for Digital Innopreneurship (see Figure 2). This triad for an associated test model refers accordingly to the selection of suitable attributes and associated analysis of a digital product/market fit (cluster 1: Cooperation Object), a digital organisational/cultural fit (cluster 2: Cooperation Mode) and a digital management/individual fit (cluster 3: Cooperation Actors) from the respective perspective of the corporate and startup that want to enter into associated cooperation [93]. Accordingly, the two perspectives should be analysed both separately and together.

On the corporates' side (see Figure 2), the selection and analysis of suitable attributes for the digital product/market fit (cooperation object) is initially determined by the goals and necessities of Digital Transformation. The focus here is on the question of how the existing products, processes, platforms and business models are to be "digitalised". On the other hand, the selection and analysis of suitable attributes for the digital organisation/culture fit (Cooperation Mode) is determined more by the company's approach to Digital Reflexivity. The focus here is on critically questioning the extent to which one's own organisational structure already fulfils the framework conditions for digital workflows, a digital infrastructure, digital communication and agile working methods, among other things [9], p. 29 ff. The selection and analysis of the appropriate attributes for digital management/individual fit (Cooperation Actors) are ultimately determined by the acting actors' personal goals and visions, trustworthiness and reliability (here: owners, managing directors, board members, managers). On the corporate side, the focus is particularly on the effects on the digital development of existing business models and processes in the existing business (Digital Exploitation).

On the startups' side (see Figure 2), the selection and analysis of suitable attributes for the digital product/market fit (Cooperation Object) is initially determined by the goals and necessities of digital innovation. The focus here is on the question of which digital added values [2], p. 56 ff. the newly

developed products, processes and platforms or business models have. On the other hand, the selection and analysis of suitable attributes for the digital organisation/culture fit (Cooperation Mode) is determined more by the company's approach to Digital Flexibility. The focus here is on the agile handling of the still limited resources, the still rather dispositive processes, and the still few employees in a highly digital environment to develop a stable organisational, decision-making and development perspective [26], p. 147. The selection and analysis of the appropriate attributes for the digital management/individual fit (Cooperation Actors) are ultimately also determined here by the acting actors' personal goals and visions, trustworthiness and reliability (here: founders). However, the focus here is particularly on developing new digital business models and processes as part of an innovation business (Digital Exploration).

On the one hand, all fit components are influenced by the basic level and thus by the general thinking, skills and actions of the people involved in the topic of digitalisation on both sides (see Figure 2). This therefore refers to a Digital Mindset, Digital Skills and Digital Execution of the various stakeholders with regard to Digital Leadership [9]. However, all fit components are also interrelated on the one hand, with the resulting definition of the framework conditions at the working level. This includes the need for joint coordination of a cooperation category to be aimed for with an associated agreement and corresponding behaviour (Cooperation Behaviour) of both partners for trusting interaction with each other (see Figure 2). On the other hand, both sides must agree on a joint investment model at the investment level (which is usually coupled with the working level), which essentially includes the investment agreement and the shareholder agreement and is accompanied by corresponding behaviour (Venture Behaviour) of both partners for the joint growth and exit scenario and corresponding communication (Investor Relations).

4. Discussion, Limitations and Outlook

"Digital Innopreneurship" can and must be viewed from different perspectives in order to analyse the direct and indirect effects of this construct on the cooperation partners involved: From the perspective of the corporates, this construct initially postulates that cooperation with startups does not replace the independent tasks of Digital Transformation in the existing business or independent digital development in the innovation business. It would be risky to place oneself in the startup's hopeful dependency and raise expectations of the small partner too high. Furthermore, the construct postulates that cooperation with a digital startup will only work if the development of the company's own digital organisational structures, which are also necessary for this cooperation, is also driven forward. External collaboration always has an impact on the internal digital organisation due to digitalisation and the associated networking. Cooperation with the digital startup should also occur on an equal footing, even if this is particularly difficult for a large partner. However, effective and joint Digital-Innovation-Development cannot happen by fiat.

If we now look at "Digital Innopreneurship" from the perspective of startups, this construct postulates that cooperation with a corporation must not replace the task of independent digital development in the innovation business. Becoming hopefully dependent on the corporate would also be risky and would prevent further independent development (depending on the cooperation model). In addition, the construct postulates that cooperation with a corporate will only work if the development of its own rule-based and structured organisational structures, which are also necessary for this cooperation, is also driven forward. From this perspective, external collaboration always impacts the company's development towards formal and professional decision-making and organisational processes due to digitalisation and the associated networking. Even if a startup also wants the cooperation to take place on an equal footing, this does not absolve it from respecting the experience of the large partner, even if this is difficult for the small partner regarding agility. However, effective and joint Digital-Innovation-Development cannot happen without an adaptation.

Finally, "Digital Innopreneurship" can also be viewed from a political perspective. This raises the question of how corporates can be supported in the necessary task of their own Digital Transformation through establishing and expanding funding programmes (e.g., investment grants for the introduction of digital technologies). At the same time, politicians can and must take care of developing and expanding funding programmes for startups so that more digital innovations are created (e.g., investment grants for developing digital technologies). These two approaches are not new, but the "Digital Innopreneurship" now also obliges politicians to set up funding programmes and structures specifically for cooperation between corporates and startups in order to leverage the joint digital potential for products, processes and platforms (e.g. funding for matching agencies or events).

Limitations

However, the overarching perspective of "Digital Innopreneurship" also raises some fundamental questions that have not yet been conclusively answered. In particular, it has not yet been clarified whether the consideration of "Digital Innopreneurship" can explain the associated aspects more or better than the three individual perspectives of "Digital Intrapreneurship", "Digital Entrepreneurship" and "Digital Interpreneurship". Is the overarching perspective merely a conceptual and thematic bracket, or does it offer added value in content, process and structure? Scientific (empirical) proof of the benefits of a coherent perspective has yet to be provided.

The overlap between the concepts of "Digital Entrepreneurship", "Digital Entrepreneurship" and "Digital Interpreneurship" in terms of the respective content and the associated

assumptions also remains unclear. There is still a lack of evidence that certain content and influencing factors are not equally relevant in all three areas and whether and how the content of these three areas and, thus, the underlying concepts differ at all. Are they merely different application areas, but the content is the same? To date, there has been little qualitative and quantitative research that goes beyond pure observation in practice and would therefore underpin the importance of an overarching perspective for "Digital Innopreneurship". Accordingly, at present it is still primarily a matter of a well-founded conceptualisation of interrelationships without these being empirically substantiated.

A further deficit can be seen in identifying and linking the actors involved. While the decision-makers on the startup side can still be defined relatively clearly (small number of founders), this is much more difficult on the corporate side (large number of different decision-makers). Furthermore, there is still a lack of literature-based evidence for selecting and composing the three attribute classes - Cooperation Object, Cooperation Mode and Cooperation Actors. It remains unclear whether there are possibly other classes or levels that could contribute to a higher explanatory value. Finally, the framework presented so far is a generic concept that does not consider weightings, dynamics, influences or causal relationships. Future research must address these aspects to increase the concept's practical suitability and theoretical added value.

Outlook

A comprehensive theoretical outlook on the topic of "Digital Innopreneurship" requires several methodological approaches. However, a central starting point is the development of a framework for evaluating and selecting suitable forms of collaboration (within the framework of "Digital Interpreneurship") between both parties on the basis of predefined decision attributes. This would address the central element of corporate-startup-collaboration and we will do this in the following article (Part 2). In addition, it would certainly be valuable to consider the design of an ecosystem to promote corporate-startup-collaborations and thus the governance options for a state to support joint Digital-Innovation-Capability. Such an ecosystem could/must certainly also consider other players, such as universities, research institutions, startup hubs, associations, etc. With regard to the further development of the concept of "Digital Innopreneurship", one could also describe the emergence and development of a phase model for the dynamisation of the development of corporate-startup-collaborations and identify the respective challenges and success criteria at the various stages. In the context of success criteria, there is also the possibility of developing a competency model to determine the required skills of the actors involved and make them objectively measurable. Furthermore, there is the possibility of developing a corporate startup governance framework to define the framework conditions for decision-making within the collaboration.

Finally, existing studies and surveys in the area of "startup and entrepreneurship activities" could address "Digital Entrepreneurship" even better. For example, the Global Entrepreneurship Monitor could expand existing approaches such as the TEA (Total Early-Stage Entrepreneurial Activity) and EBO (Established Business Ownership) values to include a TCA (Total Collaboration Activity) value and thus measure the degree of collaboration between startups and corporates in different countries, industries and sectors. This instrument could provide valuable insights into the dynamics of such collaborations and improve comparability at a global level (macro level). In addition, studies could also focus on the micro level and create an index for collaboration learning, which, in particular, records the exchange of knowledge between the actors involved. Against this background, it can be stated that the topic of "Digital Entrepreneurship" requires several methodological approaches to translate this article's conceptual foundations into theoretical concepts and validate them empirically.

Conflicts of Interest

The authors declare no conflicts of interest.

Appendix

Follow up: Digital Innopreneurship 2: The Evaluation of Collaboration between Corporates and Startups in the Digital Economy, Science Journal of Business and Management 2025, Vol. 13, No. 2, pp. 135-154.

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