

APPENDIX. OVERVIEW OF THE RELEVANT/SELECTED LITERATURE

Author (year)	Model name	Published from	Description	Variables
Westerman et al. (2012)	Digital Maturity Matrix MIT & Capgemini	Massachusetts Institute of Technology & Capgemini Consulting	The maturity model Digital Maturity Matrix is a two-dimensional model. A distinction is made here between the dimensions "Digital Intensity", which indicates the intensity of digital initiatives and possibilities, and the dimension "Transformation Management Intensity", which shows the organizational capability with regard to digital transformations. The companies to be investigated are divided into four different categories (beginners, conservatives, fashionistas, digiratis) based on the fulfilment of the different digitization variables. The digirati (or digirati) are the elite companies in digitization. The model basically shows which measures a company has to implement in order to make the most efficient use of digital change.	Vision: Leaders should have a clear vision to convey the future ideal image of the company to the employees. Digital Governance: Control of the digital strategy or set of the course by means of clear rules so that the digital activities support the achievement of the set course. Commitment: Employees should be won over to the change project. IT Business Relationships: Create a common understanding between IT and business. Customer Experience: The aim is to increase customer proximity with the help of technological means in order to create a deeper understanding of customers. Operational Processes: More dynamic and efficient processes based on digitization and its possibilities. Business Models: Adapting the business model to drive digital change.
Back and Berghaus (2016)	Digital Maturity Model University St. Gallen	University St. Gallen & Crosswalk AG	The Digital Maturity Model serves as the basis for an annual Digital Maturity Check, with which company can determine the position in the digital world. Based on these survey data, the different levels of maturity are determined and published using a consolidated report.	Customer Experience: The offer and value proposition is consistently adapted to the changing customer behaviour of digital customers, where the boundaries between online and offline interaction with the company are increasingly blurred. Product Innovation: Digital technologies are to be used to generate new services and products in order to create a competitive advantage through the resulting innovative offering. Strategy: A clear objective and vision and the resulting strategy must recognize and optimally use the possibilities that arise from digital technologies. Organization: The organization must be adapted to the new challenges by carrying out cross-departmental digital projects so that digital skills are available within the company. Process Digitization: All processes, internal and external must be simplified, unified and seamlessly integrated to enable agile action. In addition, these processes should be automated if possible. Collaboration: Due to the changed working methods in the age of digitization, technologies are to be used to support and simplify collaboration and communication between employees. Information Technology: The development and operation of IT infrastructure and information systems are flexible and agile, enabling new digital products, services, communication and transactions. The "time to market" factor plays a decisive role here. Culture and Expertise: In order for the digital transformation to be sustainable, the company must pursue a culture of openness with regard to technologies. In addition, there should be a certain willingness to take risks and an open approach to errors. Transformation Management: Digital transformation is a change process that affects the entire company and is, therefore, to be planned, controlled and supported by the top management level.

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Fenwick and Gill (2014)	Digital Transformation Assessment	Forrester Research	The maturity model Digital Transformation Assessment distinguishes between the internal view or Digital Operational Excellence and the external view or the digital customer experience. The companies to be investigated are then assigned to the different categories (Digital Dinosaurs, Digital Employers, Digital Connectors, and Digital Masters).	Improvement of operational capabilities: Digital processes must be defined in a lean and cross-company manner so that digital business models can be implemented outside the company's own core competence area. Fast customer-focused innovations: Customers, suppliers and employees act as dynamic teams. This involvement of customers and suppliers can lead to customer-focused innovations with a higher chance of survival. Digitization for agility over efficiency: Due to the ever faster-changing market conditions, agility is increasingly becoming a key factor for the success of a company. Digital holistic Customer Experience: Analyses of customer journeys are to be used to create positive experiences for the customer at various points of contact. Digital Services and Products: The physical products are to be supplemented with digital services. Trusted Machines: Better customer understanding, as well as improved decision making, should be made possible by means of algorithms and big data.
Land (2015)	Digital Maturity Model University Reutlingen & Neuland	University Reutlingen & Neuland Consulting Company	With the Digital Transformation Index process, the digital maturity level of a company. On the basis of the Digital Transformation Index, fields of action and concrete optimization potentials in individual areas can be identified. This process thus forms the basis for the digital roadmap for the sustainable further development of digital excellence in the company.	Strategy: The digital strategy is documented and communicated so that it can be understood and internalized by managers and employees. All divisions follow this digital strategy, which is reviewed and updated at regular intervals. Leadership: The management level takes over the task of designing and implementing the digital strategy. Employees from different hierarchical levels work together on the same level as the team. The digital strategy creates new task profiles for executives such as a Chief Digital Officer (CDO). People: The digital experts created by the changing act as drivers and networkers. This expertise flows into the development of innovative products and services. The role models, areas of responsibility and job advertisements have an increasingly strong business connection. Culture: The organization is highly transparent and dynamic. Decision making is supported by digital media. The employees who work at the interface to customers have a high degree of independence. The change brought about by digitisation is becoming the core theme of strategic innovation. Products: The business model has been expanded with new digital products and services that create competitive and customer benefits. The innovation dynamics in the company are very high; in addition, digitization encompasses all stages of the value chain. Operations: The exchange with the customer is regarded as a core principle for a high degree of networking with external stakeholder groups. Basically, new organizational units are available for the implementation of the digital strategy. Core processes are increasingly digitalized and external stakeholders such as suppliers are an important component. Technology: Promising technologies are used company-wide. Different approaches such as predictive analytics and real-time metrics are used. Product development is software-based. Governance: The identification of different digital strategies and stakeholders is essential. Established guidelines and steering committees are important for this. An integrated control of the digital activities is carried out.

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Gartner (2016)	Gartner Taxonomy	Gartner Incorporation	The maturity model developed by Gartner Incorporation consists of 5 different levels, which are arranged in a circular logic. It serves to determine the digital maturity.	People: What are the new challenges of digital transformation in the workplace and talent areas? Four different aspects have an impact on the variable people, namely leadership, organization, culture and talent. Customer facing: To what extent does the interaction with the customer have to change? Three different aspects affect the characteristics of variable customer-facing: customer sensing, digital workplace and business model. Operations and Infrastructure: Which processes, architectures and technologies are needed? Three different aspects affect the characteristics of the Variable Operations and Infrastructure: IT Services, Business Services and Supply Chain. Vendors: Which technology and service partners should I work with? The variable vendors are affected by two different aspects: Tech Providers and Service Providers. Emerging Technologies and Trends: Which disruptive technologies and trends need to be evaluated for the company's digital journey? Three different aspects affect the characteristics of the variable emerging technologies and trends, namely technologies, trends and practices.
Berman and Bell (2011)	Digital Maturity Model IBM	IBM Institute for Business Value	The IBM Maturity Model is a two-dimensional model. A distinction is made between two different dimensions: the dimension "Reshaping the customer value proposition" and the dimension "Reshaping the business model". The companies are assigned to different levels of maturity based on a questionnaire.	Business Model Innovation: Design and integration of new business models. The generation of customer benefits across all levels is to be regarded as a core competence to be aimed for. Customer and Community Collaboration: Increasing customer orientation should be driven in all areas of the company. In addition, the interaction with the customer should be redefined by using different social networks. Cross-channel integration: The digital and physical points of contact with customers must be integrated into the company. Insights from Analytics: The available information must be available across all levels and sources (external and internal). In addition, the advantages arising from predictive analytics and advanced analytics are to be used. Digitally enabled supply chain: All elements of the supply chain are to be optimized using digital possibilities and integrated across companies. Networked Workforce: The skills needed to seize business opportunities must be provided.
Greif et al. (2016)	Maturity Model PWC	PricewaterhouseCoopers	The PwC Maturity Model was developed to offer an evaluation scale for Swiss SMEs. It consists of 4 different maturity levels, which are used to evaluate the individual digitization factors.	Process and Infrastructure: Contains changes to processes and structures with the help of digital technologies. Internal processes are increasingly digital, linked and, if possible, automated. Digital Sale: The existing business model or earnings model is increasingly being transformed, initiated by the new possibilities of digitization. Customer Involvement: New interaction points are created for customers, with which they are increasingly integrated digitally into business processes. Employees and Culture: Creating a culture of innovation with the associated recruitment of digital talent is essential for the digital transformation.
KPMG (2014)	Survival of the Smartest 2.0 KPMG	KPMG	This KPMG model is based on a survey conducted with various German companies. The goal was to identify the most essential factors for a successful digitization strategy.	Business Models: The business model must change on different aspects or become more digital in order to open up new business opportunities. The aim is to open up new sales channels and address new target groups. Business Processes: Business processes should be increasingly digitalized and networked. Customer Focus: The digital customer is the focus of the company's actions in order to meet their needs and behaviours. Innovative Capability: A continuous innovation process that increases the speed of innovation and reduces the relevant time to market factor. Therefore, the necessary resources must be provided. Competitive dynamism: The company must be able to react quickly to changes in the markets and to identify and exploit any growth potential and opportunities in order to open up new markets if necessary.

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O'Hea (2011)	Digital Capability Framework	Innovation Value Institute	O'Hea's model from the Innovation Value Institute consists of five dimensions and five layers of maturity.	<p>Strategy and Planning: New digital transformation possibilities have been identified and are being pursued. Digital channels are becoming an essential part of the strategy. The company must be able to react optimally to competitive dynamics.</p> <p>Business and Leadership: Value generation is tailored to the needs of the customer. The company must also have a clear digital vision.</p> <p>Process Management: The processes should be digital, the resulting gains in effectiveness and efficiency must be used.</p> <p>Technical Capability: The impact of current technologies on the company must be understood. In addition, new technologies must be tested for their benefits and applicability.</p> <p>People and Culture: Collaboration among employees must be supported by digital tools. The customer journey and the customer experience, in general, must be analysed and constantly improved.</p>
Mueller et al. (2006)	The Digital Maturity Map	Design Society	This model was developed for the automotive industry to evaluate their early need for automation compared to other industries. Therefore the model is used especially for experts from the automotive industry.	<p>Data Maturity: Since the digital methods and digital processes are based on data, it is important to guarantee that they are syntactically correct. In addition, the data must be checked for timeliness and relevance.</p> <p>Digital Product Maturity: Comparison between the analysed behaviour of a digital model and the actually required properties of a product. The behaviour of the product is assessed from a functional or product-based perspective.</p> <p>Engineering Process Maturity: The quality of the development process is described, also taking into account the integration of different stakeholders. This is a cornerstone for the success of a product development project.</p>
Kiron et al. (2016)	Aligning the Organization for its Digital Future	MIT Sloan Management Review	This model was published in the MIT Sloan Management Review magazine and is based on an idea from the 1980s that companies can only be successful if the four basic values of culture, personnel, structure and tasks are coordinated and compatible. This model should make it possible to establish a uniform culture throughout the company and to avoid discrepancies between different parts of the company as far as possible.	<p>Strategy: The so-called zoom-out/zoom-in approach should be used in order to react optimally to the digital future. With zoom-out, a time horizon of 10 years is considered by making forecasts regarding the market and customer requirements. In contrast, the zoom-in approach looks at the next six to twelve months.</p> <p>Tasks: Complex and slow recruitment procedures can be an obstacle to finding the right talent. New working models have to be created, such as freelance or home office.</p> <p>Culture: The willingness to take risks must be given within the company in order to be successful in the age of digitization.</p> <p>People: Employees must be given the opportunity to acquire new digital skills. The employment of external resources is only intended to bridge short-term periods, as otherwise no digital skills will be built up within the company.</p> <p>Structure: The hierarchical management structures existing in many companies. They were defined in more stable times. In the age of digitization, it is essential to use leaner management structures in order to be able to react quickly to changes.</p>
Valdez-de-Leon (2016)	Digital Maturity Model for Telecommunications Service Providers	Technology Innovation Management Review	This model was developed according to comprehensible scientific standards. It is intended to provide a complete overview of the digital transformation in a company, while at the same time specifically meeting the needs within the intended context, and to enable a standardized comparison with other companies within the telecommunications industry.	<p>Strategy: The implementation of a digital strategy based on a clear vision, governance, clear planning and management processes.</p> <p>Organization: Make necessary changes in communication, culture, structure, training and knowledge management within the organization to become a digital company.</p> <p>Customer: Increased customer involvement and the creation of new customer experience benefits through the digital transformation of the Customer Journey.</p> <p>Ecosystem: Creating and maintaining common ecosystems as partners form an important basis for the digital business.</p> <p>Operations: The focus should be on the skills that support service delivery. This leads to a more digitized, automated and flexible way of working.</p> <p>Technology: Represents the ability to plan, deploy and integrate the effective use of technologies to support the digital business.</p> <p>Innovation: Focusing on the skills that lead to more flexible and agile ways of working that form the basis of an effective digital business.</p>

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TM Forum (2017)	Digital Maturity Model TM Forum	TM Forum	The Digital Maturity Model was developed over many months by industry leaders to help define a company's digital maturity level. The model is basically divided into five different dimensions.	Customer: An experience should be created for the customers so that they regard the company as their preferred digital partner. The interaction takes place via the desired channels of the customer. This variable also includes the topics of Customer Engagement, Customer Experience, Customer Insights & Behavior and Customer Trust & Perception. Strategy: Deals with the transformation and operational business of the company to leverage competitive advantages through digital initiatives. The digital strategy is an essential part of the corporate strategy. This variable also includes Brand Management, Ecosystem Management, Finance & Investment, Market & Customer, Portfolio, Ideation & Innovation, Stakeholder Management and Strategic Management. Technology: The use, storage, processing and exchange of data plays an enormous role in the success of a digital strategy. In addition, to meet customer needs and reduce costs. This variable covers the areas of Applications, Connected Things, Data & Analytics, Delivery Governance, Network, Security and Technology Architecture. Operations: Increase business efficiency and effectiveness through the use of digital technologies in the execution and development of business processes. This variable includes Agile Change Management, Automated Resource Management, Integrated Service Management, Real-time Insights and Analytics, Smart & Adaptive Process Management, Standards & Governance Automation. Culture, Organization and People: Definition and development of an organisational culture with associated governance and talent processes to support digital transformation in the company and achieve growth and innovation goals. This variable deals with the topics of Culture, Leadership & Governance, Organizational Design & Talent Management and Workforce Enablement.
Carolis et al. (2017)	DREAMY Maturity Model	Springer International Publishing	The aim of this model is to represent a scientifically comprehensible model for production companies. The model is basically divided into five different dimensions.	Design & Engineering: Design of the production process in the areas of quota, concept, requirements & product planning, product design & engineering and plant design & engineering. Production Management: Planning and administration of production include the areas of Production Planning, Production Scheduling, Production Execution and Production Monitoring & Control. Quality Management: Guarantee of quality made possible by Product Testing and Quality Management in Production. Maintenance Management: Concrete and structured maintenance activities made possible by maintenance engineering, maintenance planning, maintenance execution and maintenance monitoring & control. Logistics Management: Includes all logistical activities and is supported by Inbound Logistics, Internal Logistics and Outbound Logistics.
Schmitz (2015)	Maturity Scape Model	International Data Corporation (IDC)	Using this model, the digital maturity level of a company can be determined in order to subsequently derive suitable measures for improving the digital strategy. For each of the five levels of maturity, there are recommendations on how an enterprise can reach the next level of maturity.	Leadership: Leaders must be able to define the role of the company in the age of digitization and decide which level of maturity must be reached in order to achieve the business goals. Information: Finding and determining the correct data to support the company in the digital transformation. The definition of a stable information architecture is indispensable. Knowledge exchange and collaboration must be encouraged. Operating Model: Existing business models are to be transformed or new business models created, based on the integration of digital technologies and the use of the resulting opportunities. Omni-Channel Experience: A new cross-channel customer experience is to be created. Interaction takes place via the channels preferred by the customer and can be digital as well as physical. The focus here is also on the resulting diverse dimensional marketing opportunities. Working World: In order to take advantage of the digital transformation and the resulting opportunities, the company must have employees with digital skills. New requirements are arising in the recruitment area.