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A Measuring Tool for the Digital Maturity of Small and Medium-Sized Enterprises

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Abstract
In digital revolution, the appropriate IT infrastructure, technological knowledge are essential for the success of companies, where the success of the digital transformation depends on digital maturity. The aim of the study is to define the digital maturity, theoretical foundation of the digital maturity model and present a framework for small and medium-sized enterprises (SMEs) understanding where they are in digitalisation (how advanced their digital resource system and digital approach) to respond faster and efficiently to environmental changes. The model construction is based on theory of dynamic capabilities, graduation models, and SMEs management challenges. The model is a dynamic model to support management in strategic, digital and organizational developments, which is divided into IT and organizational dimensions, including 6 components and 28 subcomponents. The ultimate goal of the study is to determine the component weights to create a neurofuzzy model.

Keywords
Digitalization, Digital maturity model, SMEs, Fuzzy method.

Introduction

Our world and our society are changing at an incredible rate, and there's no going around new technologies and technical development, as it is deeply woven into our daily lives. For that reason, it is needed to have qualified employees, train of existing employees further, develop the skills and capabilities continuously, map possible shortcomings [44] (Ulas, 2019). The current epidemic also supports this, as it led to the development of a new business environment in a matter of weeks, significantly accelerating the necessity of the digital transition of actors working in various industries. SMEs, comprising the backbone of economy, are no exception either, and it is even more essential for them to keep up with technological (technical) development. For that, it is important that company leaders and decision makers recognize the application possibilities, and that they accurately define the objectives they want to achieve as well as their timeframe (Kilimis et al., 2019).

There is a long-standing debate on whether information technology (IT) impacts the performance of the company in any way. However, the investigation of IT and factors relevant to it is made significantly more complicated by the fact that computer science solutions are constantly evolving (Tippins & Sohi, 2003). One of the most useful theoretical perspectives for assessing the relation between IT and company performance is the resource-based view (RBV) (Barney, 1991). The resource-based view of IT shows that businesses can use information technology resources to stand out, and that the improvement of dynamic capabilities contribute to the performance and growth of SMEs (Liang et al., 2010).

Digital maturity models (DMMs) help companies determine where they stand in digital development. It is important that businesses are aware of this, because contrary to how IT used to be viewed as a secondary, background support tool, it can be seen in recent years that it can have a great impact on internal and external business processes that affect the performance of the company. A number of maturity models have been created over the past few years, which examine the decisive factors of digital maturity. In case of SMEs, these models mostly involve Industry 4.0.

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Based on the above, the primary goal is to develop an objective measurement tool, the Digital Maturity Technical Architecture (DMTA), the theoretical foundations and framework of which is discussed in the present paper, including the clear definition of terminology needed for the theoretical background and the effect of dynamic capabilities to the performance of SMEs. During the development of the model, various maturity models have been looked at that could serve as a base for the DMTA, and compiled them to create the framework for the DMTA, which comprises six key components. Professional surveys were used to determine the weighing of the model components, which provided the model inputs to fuzzy model.

This helps SMEs assess their digital maturity and therefore make the right decisions to facilitate their progress, since an increase in the level of digital maturity increases competitiveness in areas such as customer satisfaction, product quality and cost effectiveness.

Theoretical framework

ICT tools in competitiveness from the aspect of resource-based theory

If SMEs want to stay competitive, they must keep up with the technological and technical developments, because the information and communication technology (ICT) affects the profitability, growth, market value, social and environmental performance, and satisfaction of SMEs (Tarutė & Gatautis, 2014). Moreover, that companies having dynamic capabilities in this technology-oriented environment are able to review and reconfigure their resources and protocols to adapt to fast-changing conditions. However, it is hard to tell to what degree small businesses are able to develop such critical capabilities and ensure their future competitiveness (Teece et al., 1997; Parida et al., 2016). This theory is based on the dynamic capability approach, which extends the RBV of the company and focuses on whether businesses are able to change their resource base specifically to improve their competence in this environment and ensure their survival (Nagyné & Gubán, 2019; North et al. 2019).

According to the framework of the VRIO (Valuable, Rare, Imperfectly imitable, Organization) model (Barney, 2001) informatics cannot create sustainable competitive advantage due to the replication of IT tools. If the company has state-of-the-art IT applications but there are no well-qualified employees in the organization, these options do not hold any value for the company (Nagyné et al., 2018; Ong & Ismail, 2008). It should be mentioned that a high-quality computing or IT background does not necessarily lead to a market advantage in the case of many companies – not just SMEs. These all show that besides looking at the quality of IT resources (hardware, software), the maturity model to be developed also needs to analyze the integration of these into the environment.

From an IT perspective, there are significant differences between SMEs and large organizations. First of all, SMEs often use information technology as a tool for processing information, and secondly, they have much less available resources to implement ICT in their solutions (Antlová, 2009; Ramdani et al. 2013). However, it also has to be pointed out that a less complex structure could be beneficial for them, as it makes them more flexible when facing changes (Consoli, 2012). The SMEs are more limited by their external environments, they are much more sensitive to the availability of environmental resources, and their business processes are rather unique and less formalized (Neirotti & Raguseo, 2017). The authors believe that this is especially important in the case of the digital maturity model too.

Maturity model types

The concept of maturity was first defined by Philip Crosby in 1979, as a full, perfect or ready state (Tarhan et al., 2016). On the other hand, defined it as the development of a special capability or the achievement of a targeted success from start to the expected stage. So it means progress in the demonstration of a given capability or the achievement of a goal between the initial and the desired or the usual final stage (Mettler, 2009; 2011).

In this research, maturity means a hybrid version of these two. The first one is a static state completely fulfilling expectations. The second one is a dynamic definition representing a process of change. The static state is not enough for the assessments, because for purposes of research, maturity has to mean the fulfilment of quality requirements of the given professional environment or a way to relate to it.

Maturity models are built on the general qualitative model and allow the assessment or evaluation of the current situation of the company, they help to find the areas that have to be improved, facilitate the tracking of progress and give guidance in starting the transformation (North et al., 2019; Mosallaeipour et al., 2018).

In the case of maturity assessment models, the term maturity most often focuses on either the process or the object or human capabilities. For processes, it is usually an important factor whether the process is well defined, measured, controlled, and how efficient it is. While for objects, it matters to what degree it reaches the predefined level of sophistication, and for human capabilities, how much the workforce is able to increase efficiency (Mettler, 2011).

Maturity models primarily focus on set goals and the developmental scales defined by them, which make the movement between various levels easy to measure. These all contribute to making the initial state accurately definable and the attributes necessary to attain the desired, ideal state easily identifiable. It mostly builds the desired developmental curve divided into discrete stages, which can be considered maturity levels built on one another (Caralli et al., 2012).

A distinction should also be made between readiness models and maturity models, as readiness models show whether an organization is ready for starting the development process, while maturity models aim to demonstrate the maturity level of the organization (Mosallaeipour et al. 2018). In this regard, the second aspect is the one that is applicable for the authors.

Determining digital maturity

Digital maturity is more than the application of new technologies/techniques. Essentially, the company coordinates the workforce, the culture, the structure and its responsibilities by making use of the opportunities provided by the technological infrastructure within and outside the organization (Kane et al., 2019). It can be viewed as constant adaptation, so in case of digital maturity, the ability to react to changes adequately is also important, with digital capabilities having a key role, as these help to understand how businesses can become digitally mature. Maturity as a quality feature is constantly changing; it develops gradually over time, over which process companies learn to properly respond to the digital competitive environment. But for that, leaders need to know the working methods relevant to digital trends, so that the organization can suitably integrate to the given environment. So proper adaptability is definitely one of the keywords when it comes to achieving digital maturity (Kane et al., 2017).

A company has to overcome several obstacles in order to become adequately "mature" digitally. The biggest barriers are often the lack of strategy and the competing priorities. The lack of digital strategy is typically the greatest obstacle in the case of businesses in the early stages (Kane et al., 2015). It must be emphasized that the digital strategy does not focus on a particular unit of the company, but it pervades the entire organization with all its functions and processes. For that reason, it is a cross-functional strategy (Fehér et al., 2017).

Companies that are still at the beginning of their path of becoming mature have limited ability to focus separate digital technologies on solving various business issues. It is also typical to these companies that their leaders do not pay enough attention to the possible future benefits of digital initiatives, i.e. there is a lack of commitment at the higher organizational levels (Kane et al., 2019). However, more mature companies clearly use digital technologies in order to achieve strategic goals. These organizations do not tolerate skill gaps; for them, the ability to quickly adapt to change is a key capability. Compared to businesses in their early stages, companies on the path of becoming digitally mature are more likely to have a clear digital strategy and a culture that motivates the company to take risks (Kane et al., 2015).

From a technical aspect, the digitally mature companies are developing the four technologies (social, mobile, analytical, and cloud) at approximately the same rate. These companies start using complex innovations building on digital strategies when they transform the business, and they have proper internal operating processes with a focus on priorities, process automation, the remote monitoring and implementation of various procedures, and the automation of human activities (Fehér et al., 2017). This solution might seem evident, but it requires a large-scale, well-coordinated process with high-level organization and substantial resource needs. They also put a bigger emphasis on the further training of their employees, so they are willing to invest in the innovation of workers (Kane et al., 2019).

To be able to judge or measure the digital maturity of a company, it is best to use a digital maturity model. The digital maturity model may be used in the various stages of digital transformation in order to help identifying possible shortcomings, determining the key area that the company needs to focus on, and from where it could take its first steps (Deloitte, 2018). The authors' investigations showed the above permissive, as it does not require the use of models, but solution definitely calls for the creation of a carefully designed model to be used for determining digital maturity.

Digital maturity models

Numerous maturity models have been created over the past few years, examining the determining factors of digital maturity, but the maturity level of SMEs, and the actual index number are unknown, as most of these models were designed for large corporations. Also, digital maturity models are primarily developed by business practices, and the academic literature does not have consensus yet regarding a standard maturity model for digital transformation (Reis et al., 2016). As it can be seen, digital maturity focuses on several different factors in the organization, and handles them in an integrated way.

During the literature review, the following keywords were used both in Hungarian and in English in the Google Scholar, ScienceDirect, and Emerald databases:

"Digital Maturity Model", "Digital Maturity Model and SME", "Maturity Model Assessment".

The time interval was also an important consideration in the search, as the IT field requires that studies older than five to ten years should not be considered. After analyzing the titles and abstracts, only 23 papers were found, that focused on SMEs. Most of the articles containing digital maturity models were related to Industry 4.0. However, the goal was to find models that examined the topic in general, so after studying all articles, 11 studies relevant to the research were identified.

In order to make the model fit the needs of SMEs as much as possible, it must be explored why the digital transformation of these companies is more difficult and slower. The first reason is that these small enterprises are less exposed to rapid digitalization. The next fact is the leaders' lack of commitment, understanding and a vision of the impact of digital transformation. The third factor is that similarly to large corporations, SMEs also tend to opt for a gradual digital approach. Nonetheless, accepting information and communication technologies in SMEs has its own characteristics, which could depend on the joint impact of their size and the competitive environment (Gruber, 2019; Neirotti et al., 2018). One of the most frequent obstacles is probably the limited resources. Such investments often depend on the financial performance of the company. The issue of how open companies are towards digitalization is not always a matter of finances or tools, but more a question of how much they are able to understand the concept, which is influenced by national characteristics.

The various factors of the models are shown in Table 1. These models confirmed what was discussed above, i.e. that with the exception of a single model, all models have the importance of the organization, culture and technology as a common factor of digital maturity, regardless of the company size (Gill & Van Boskirk, 2016; McKinsey Digital, 2016; PwC, 2016; SAP, 2017; Lloyds Bank, 2017; Deloitte, 2018; Blatz et al., 2018; Mittal & Wuest, 2018; Pirola et al., 2019; North et al., 2019).

Similar components will be used for the DMTA, with the addition of human and organizational factors. The categorization of the Lloyds Bank [20] (Lloyds Bank, 2017) shows that they categorized smaller businesses based on factors that are "evident" in the current economic environment, and the use of which are a given in the case of bigger companies, but not so in the case of most SMEs, unfor-

Table 1
Factors of digital maturity

Literature review	Company size	Examined factors
Gill & VanBoskirk (2016)	general	culture, technology, organisation, insights
McKinsey (2016)	general	strategy culture, organisation, capability
PwC (2016)	SME	processes and infrastructure, digital sales, customer involvement, people and culture
SAP (2017)	large	management of digital transformation, organisation, culture, skill management, learning experience, absorptive capacity, learning measurement
Lloyds Bank (2017)	small	webpage, email, goverment digital services, internet banking, digital financial instrument usage, presence in social media
Deloitte (2018)	large	customer, strategy. Technology, operation, organisation and culture
Blatz et al. (2018)	SME	strategy and leading, corporate culture and organisation, IT infrastructure, data maturity, process and opration, product
Mittal et al. (2018)	SME	finance, people, strategy, process, product
Pirola et al. (2019)	SME	strategy, people, processes, technology, integration
North et al. (2019)	SME	growing, strategy, mindset, resources

tunately. That is why the most popular models do not reflect the unique needs of SMEs. When designing the DMTA, bigger emphasis on IT factors was also placed, just as the bank did, as smaller businesses often run into difficulties even in ensuring the proper technical/technological background.

Blatz, Bulander and Dietel (2018) look at the level of SMEs' digitalization from a different approach. They determine it in the process of creating product-service systems. They focus on processes; capabilities become secondary.

Mittal, Romero and Wuest (2018) apply an intelligent production maturity model to SMEs, with the help of which they are able to assess their maturity level and identify the inputs necessary for reaching the next maturity stage in the organizational dimension.

North, Aramburu, and Lorenzo (2019) take into account the attitude shift, which is of crucial importance for SMEs, as the mindset always has to be the first one that is changed.

Regarding complexity, the models of Pirola, Cimini and Pinto (2019) and North, Aramburu, and Lorenzo (2019) are closest to the DMTA that is also built on similar factors, but the technical/technological (IT) background will be stronger, because the authors think that SMEs do not pay enough attention to acquiring these.

Choosing the components of the model, the authors considered the subsets of all dimensions that appear in the Table 1, compiling some topics under a common name, and including resources and capabilities based on the RBV. The DMTA is an outlook for future fuzzy modeling, since the fuzzy is able to handle the problems of the complex systems (Chakraborty & Das, 2019; Tiwari & Tiwari, 2019).

Framework of Digital Maturity Technical Architecture

Methodology

The model aims to help SMEs measure where they currently stand in the area of digitalization (how advanced their digital resource system and digital approach are) and show how they can respond more quickly and effectively to environmental changes. Furthermore, it also points out what types of shortcomings they face in terms of digitalization and in which areas they need to make improvements.

Our model is based on RBV, graduation models, and SMEs' management challenges. The construction of the model uses the measurement scale of maturity models.

According to our interpretation, the definition of maturity (dynamic) is the characteristic quality value of the current state of the parameters at the given examined time point, which we compare to expectations and/or competitors. The parameters are predefined and stable for a period of time. Note: The parameters can change dynamically over time and the maturity level of the quality value can also change, even if its numerical value remains the same.

In our case digital maturity embodies the strategic, technical, technological and human resource characteristics of a digital organization.

We create a quantitative measuring device to determine the digital value. The model is a hybrid one and is based on the classification of maturity models, which combines the features of assessment and ability models.

The lifecycle of the model is illustrated in Fig. 1.

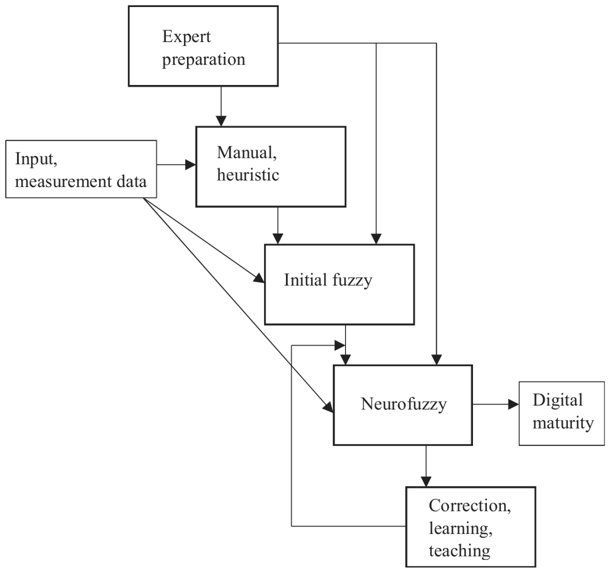

Fig. 1. Life cycle model of Digital Maturity Technical Architecture

The first step is to identify the main components and then hierarchically the subcomponents which play a role in the design of the DMTA. These are recommended by and are based on consensus among experts. This is the goal of this study. With their help, we also create the weights of components. In the second step, we create the DMTA for known and specific SMEs "manually" and/or with a heuristic solution. The values so obtained are subjected to further manual tuning.

The following components were determined based on specific factors of the different digital maturity models (Fig. 2). Its validity changes dynamically.

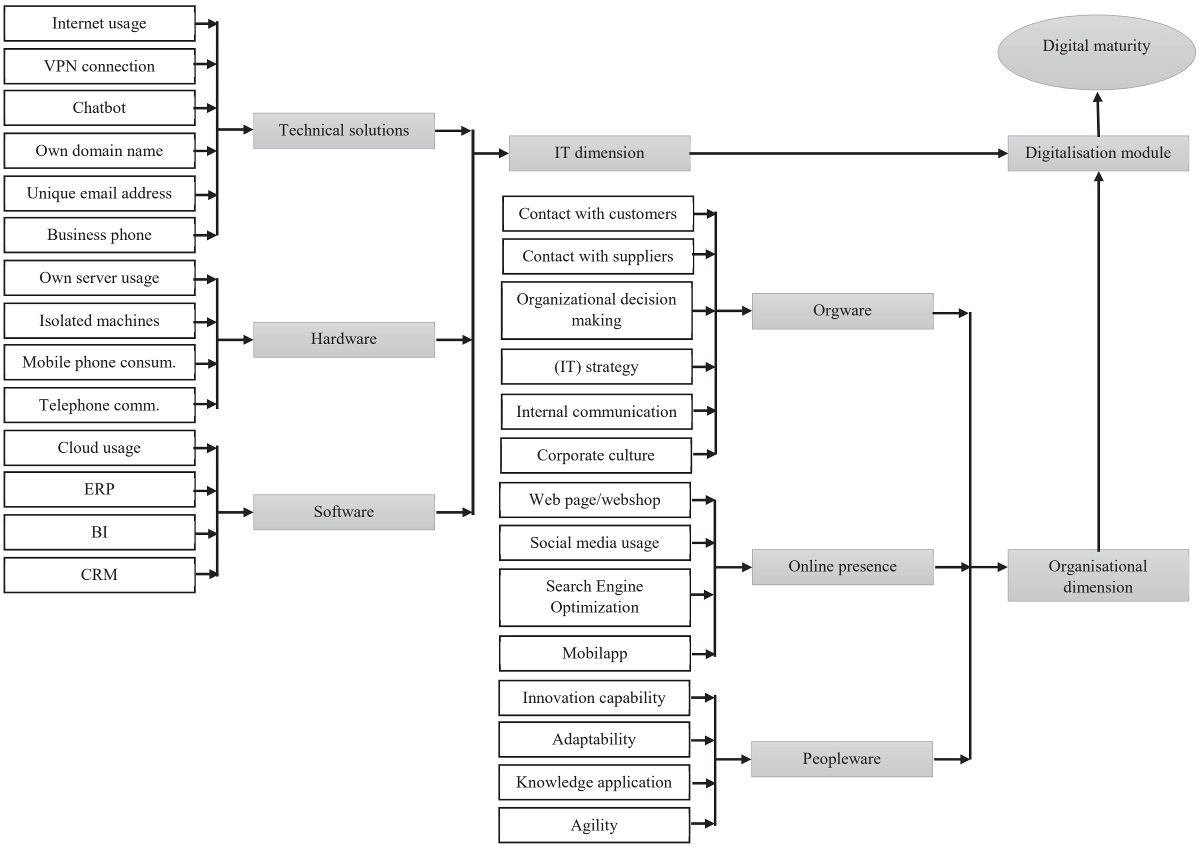

Fig. 2. Framework of Digital Maturity Technical Architecture

Basically, two dimensions are separated, the IT dimension and the organizational dimension. Both of them contain three-three main components. Thus the model includes 6 main components and 28 dynamic subcomponents. The main components were designed to include no more than six subcomponents, as the applicable pairwise comparison method would result in a large expert questionnaire. It was a design consideration that the internal connection between them be weak, thus covering a larger study area.

The first main component is Technical Solutions, which contains six subcomponents: Internet usage, VPN connection, Chatbot, Individual domain name, Unique email address, Business phone. These could be evident, but their application at SMEs offer obvious benefits.

Within the second main component (Hardware), it is sufficient to examine four subcomponents, as most SMEs do not rely on strong hardware solutions, they increasingly rely on cloud services. The subcomponents: Use of own server, System of individual standalone machines, Consumerisation of mobile phones, and the Role/proportion of telephone communication in the information flow of the business.

Within the main component "Software", it is examined the quality, frequency, security and speed of Cloud-based services during model-based measurements. In the case of the ERP component, it is examined how well it is adapted to the organization and how sensitive it is to the changes in the environment. The BI is involved in the operational processes of the examined SME. The CRM aims at the qualification and analysis of the partners.

The Orgware also has six components that show how well ICT fits the organization. IT strategy, Internal Communication, and Corporate Culture subcomponents are to be understood in their traditional sense. The four subcomponents of the online presence (Website/webshop, Social media, Search engine optimization and Mobile application) examine the quality of the company's presentation, marketing activities, presence and activity. The Peopleware examines the quality of personnel operating in the ICT environment within the organization in terms of IT affinity. This fits our later fuzzy model. The Website/webshop is a fuzzy language variable and then the language values assigned to them will show its usefulness. In this way, Knowledge Application is also understood as a language variable, and its established values provide the exact content (Novák et al., 1999).

In the three different questionnaires, the method of pairwise comparison was used where the IT and organizational dimension questionnaires contain 27–27 pairwise comparisons and the general questionnaire contains 15 pairwise comparisons.

Not all factor groups participate with equal weight in the maturity model. To determine the weights, expert questionnaires were sent out in a targeted, online form in June 2020 to IT and management professionals skilled in the subject. The questionnaires focused on the relationship between each factor, based on which the respondents' preference systems were combined in an aggregate weight. For the questionnaires, a transformed Guilford method was used, based on which the responses of the respondents who were found to be inconsistent were filtered out. The number of questionnaires filled in by IT professionals was 45, the number of questionnaires filled in by management experts was 27, and 50 general questionnaires were returned filled-in. From the IT side, 23 practicing SME IT specialists were recruited. Among the experts were 14 managers or middle managers well versed in IT (not only at the application level). 8 people are researchers/higher education specialists proficient in IT-SME research. In the list of management experts, of which 18 were SME managers or middle managers, 5 were specialists in decision support and 4 were researchers/higher education specialists. The value of consistency was set at 0.95. In the questionnaires, pairs of subcomponents related to the same expert circles were offered to the experts in a mixed way, thus avoiding that the respondents focus on the final result. As the importance of each factor may be different for each expert, the first step in the comparison procedure is to apply the same weighting method to each factor evaluated (Faust, 2011). All components and subcomponents play an important role; their relationship to each other is important to us, so we used a modified ratio scale, where the correction factor was set based on the agreement index and then normalized (Kindler & Papp, 1977).

Weights of main components

We obtained the following results for the main components: 25 experts shared their opinion with a level of consistency above 95%, whereas their agreement rate was 0.65. This value is not very high but surprisingly good. Therefore, we did not have to apply a very high correction factor. The calculated weights are shown in Table 2.

Table 2
Weights of main components

Component	Weight
Peopleware	0.28354
Online presence	0.18153
Technical solutions	0.17731
Orgware	0.17523
Software	0.11697
Hardware	0.06543

In a previous study, we obtained a similar result (Barney, 1991). Both IT professionals and management experts clearly consider that human factors are the most important in the case of digital standards. The role of Hardware has been pushed into the background. This may be due to the availability of very high quality cloud services and analytics tools for SMEs that do not require technical solutions with strong hardware solutions. The role of online services for SMEs has strengthened in the past 5-6 years and during the restrictions. Moreover, due to the restrictions during the peak of the virus and the prevalence of home office, these services started to fulfil additional roles.

The model

Hereinafter we build the model for determining digital maturity with the help of the components shown in Fig. 2. It is necessary to measure a lot of SMEs with the help this tool. On the basis of this the neurofuzzy model will be created with the training and test data and used for measuring digital maturity

The components appear together with their weights (Table 3).

Among the components, the knowledge application and innovation capability are in the first and the second place, which is perhaps not surprising, as the application of technology/techniques does not benefit companies without adequate knowledge and development. This is confirmed by the literature. The other components show a mixed picture, but based on the judgements, it can be seen that the technology side tends to be pushed into the background.

The weights obtained in Table 3 play a role in the heuristic processing. Since we do not have an initial data system with which to create a digital value or a measure corresponding to the above components; for the SME to be examined, each subcomponent is scored on a discrete integer finite scale, then converted to the same score system and finally normalized. This

Table 3
Weighted model components

No.	Component	Weight
1.	Knowledge application	0.10223
2.	Innovation capability	0.08032
3.	Web page/webshop	0.07223
4.	Adaptability	0.06691
5.	VPN connection	0.05282
6.	Contact with customers	0.05059
7.	Search Engine Optimization	0.04564
8.	Own domain name	0.04366
9.	Mobilapp	0.03958
10.	Cloud usage	0.03617
11.	BI	0.03458
12.	Agility	0.03408
13.	(IT) strategy	0.03407
14.	Unique email address	0.02969
15.	Organizational decision making	0.02816
16.	ERP	0.02813
17.	Chatbot	0.02772
18.	Own server usage	0.02611
19.	Corporate culture	0.02446
20.	Social media usage	0.02408
21.	Mobile phone consumerization	0.02137
22.	Contact with suppliers	0.01897
23.	Internal communication	0.01897
24.	Internet usage	0.01862
25.	CRM	0.01809
26.	Telephone communication	0.00925
27.	Isolated machines	0.00870
28.	Business phone	0.00480

must be done because a specific weight system of components is already available within the model.

Using the weight system, we determine the value of the main components using a linear combination, and then the value of the digital maturity can be calculated directly from the subcomponents (also with a linear combination), which will fall in the interval [0; 1]. The closer it is to 1, the more mature the company can be declared.

The value thus obtained should be manually tuned by means of reconciliations and comparisons. After we have managed to measure a sufficient number of SMEs, to further improve the model, we will subject it to a Fuzzy valuation. Using weights, an appropriate fuzzy membership function can already be built upon this initial model. Fuzzification is performed in three layers according to the model. The reason is to not have too many rules. If we were to do it in one layer, our rule set could be on the order of 2×10^{13}. This would completely overcomplicate the calculation. With this solution, we can squeeze it down to between 2000 and 4000 (the value depends on the number of membership functions). As a result, we obtain which subcomponent and component evaluations need to be modified to get acceptable indices. The initial data systems thus obtained will be used as learning data to develop the final simulation tool, Neurofuzzy. The resulting tool will already be able to quantify the digital maturity of any SME.

If we are successful to have a subset of the SME sector to examine, then we can compare it with their competitors based on the value of their digital maturity determined by the simulation, and this also provides an opportunity to highlight which components should be changed for greater improvement. Furthermore, in the final model, the current value is presented on the input, so by changing components we can keep track of where a given company is lagging behind and where the company has a competitive advantage.

Conclusions

The aim of this research was to be able to determine the combined level of maturity of the factors mentioned above in a digital maturity model. In our study, we presented the framework of this model, where we determined the weight of the main model components (Online Presence, Software, Technical Solutions, Hardware, Peopleware, Orgware) we defined as input to the measurement tool. However, in order to define the elements of the model, we first had to interpret the concept of digital maturity. After coming up with the definition, the framework of the model has been developed taking into account the elements of maturity and digital maturity models in different works of literature. Regarding the weights of the main components, both IT professionals and management experts consider human factors to be the most important for the digital level, which is also supported by the literature. Among the subcomponents, the consumerisation of the Mobile Phone received an outstandingly high value, which reflects the attitude of small businesses as well as sole traders. The importance of CRM lags behind other factors, which may be due to the fact that smaller companies prefer to do customer management through their own contacts. Examining other subcomponents, security also comes to the fore through the VPN connection, and Knowledge Application and Website can be considered outstanding from the point of view of digitalization as well. It is also necessary to point out that specialists expressed the most contradictory points of view in the case of the Orgware component, i.e. the individual subcomponents are not sharply separated in terms of weights. The argument behind creating the model is that in addition to the fuzzy model, the model can also be used to describe systems which are less or not at all analytically modelable. This makes it possible to create systems of inference that are very similar to human thinking. Furthermore, the raison d'être of the fuzzy model is also justified by the fact that, for example, in some cases, the numerical value obtained for a given software environment may be appropriate but may also be sufficient as well. The next step is to measure the SMEs with this tool and to check how they reflect the reality and tune manually the weights until we get acceptable tool. Then the AI based model will be prepared.

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