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HOW THE DIGITAL MATURITY LEVEL IS SHAPING THE CONNECTED CONSUMER FUTURE?

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Abstract: *In the age of the connected consumer, the digital transformation process of the organization has become a major concern, but also the key to success for certain businesses. Therefore, a new approach in marketing and management is proposed. This paper aims to extend the theoretical Analytic Processes Maturity Model (APMM) by introducing the criteria and its contributions to the decision-making process within SMEs concerning the five levels of the digital maturity model. The study is designed in five sections: i) an introduction of literature review presents the major concerns about this topic; ii) the methodology is represented by Analytic Processes Maturity Model and Analytic Hierarchy Process used to arrange the criteria to shape the hierarchic structure; iii) the results showcase which of the criteria contributes the most to the digital transformation and which category of SMEs is the most prepared for a digital transformation; iv) the discussions and v) conclusions section reveals what are the challenges and the solutions for managers to achieve the digital transformation of the organization goal.*

JEL classification: L26, O32, I21, M10

Key words: digital transformation, digital maturity, analytic processes maturity model, analytic hierarchy process

1. LITERATURE REVIEW

The New Digital Era is presenting a completely changing way of how people and companies interact (Canziani and MacSween, 2021; Dinesh, 2015; Kapoor et al., 2021; Kim et al., 2021; Melović et al., 2021). In this context, a question highlights the concern regarding the connected consumer: How can we ensure meaningful moments for consumers in global

markets (Stephen and Ahmad, 2017)? They create, communicate and deliver information that influences other consumers, so understanding them is crucial for the online world (Shah and Loiacono, 2016). Data Analytics plays a vital role (Moorthi et al., 2021) and the need for digital transformation is a well-known challenge (Matarazzo et al., 2021; Scuotto et al., 2021; Stich et al., 2020). The paper aims to identify how can SMEs digitally transform more easily to provide a better experience to connected consumers. Starting from their level of digital maturity, the author extended the Analytic Processes Maturity Model with a performed Analytic Hierarchy Process Analysis to identify which one of the levels contributes the most to the goal of digital transformation of the organization. The paper is structured in five sections, starting with a literature review followed by the introduction of the deployed methodology. The results are presented in section three, the discussion and the conclusions highlighting the valuable scientific contribution brought in front of the academic world.

Many studies present the ability of technology's use for commercial purpose as a challenge for companies (Balakrishnan, 2020; Hasan, Shams and Rahman, 2020, and Hemalatha, 2020) because of Many studies present the ability of technology's use for commercial purpose as a challenge for companies (Balakrishnan, 2020; Hasan, Shams and Rahman, 2020, and Hemalatha, 2020) because of the customers that are creating their value with an organization (Mohamed and Peter, 2020). Undoubtedly, companies cannot expect one uniform response from all consumers; some of them may take wrongdoing in stride, while others may never forgive the brand (Trump, 2014). Consumers have become increasingly digitally active over the last decade and are progressively adopting digitalised services, being able to customize products, track their orders, envision potential purchases and so on (Tunn et al., 2020). There are more than four billion consumers with access to the Internet where blogs, review sites, and social media platforms expose them to hundreds of millions of reviews, comments, and Tweets (Bastos and Moore, 2021). Companies such as Yelp, Amazon.com, and CarWale.com provides an online platform where existing consumers rate and share their feedback about the product and the service they use (Singh et al., 2021), so, a business model that does not adapt to a digital environment, is surpassed by innovative fast-growing digital entrants and suffers as a result of this (Verhoef and Bijmolt, 2019). With umpteen digital content options for connected consumers, marketers need to know which digital marketing campaigns match their needs (Saine, Matos and Zhao, 2020). Research is needed to adopt an omnichannel focus to

meet consumer behaviour across multiple channels and touchpoints simultaneously (Hsia et al., 2020; Verhoef, Kannan and Inman, 2015) to reach consumer satisfaction (Alaimo, Fiore and Galati, 2021). To do so, Data Analytics plays a vital role in e-commerce (Moorthi et al., 2021), especially for SMEs, that can meet new opportunities in a digital international business environment (Tolstoy et al., 2021). 'The challenges of using data analytics in e-commerce are the need for changes of organization culture and practice to attain the business target, how to identify the customer requirements to provide personalized recommendations and offers (Moorthi et al., 2021). To remain competitive in a digital world, it is fundamental for an organization to adopt specific aspects of the phenomenon of digital transformation (Durão et al., 2019).

The need for a digital transformation is significantly increased (Gong, Yang and Shi, 2020; Tassabehji, Hackney and Popovič, 2016; Vial, 2019) and the SMEs that understand and take action to a continuous adaption will have notable advantages (Correani et al., 2020) will become more competitive (Verhoef et al., 2019; Verhoef and Bijmolt, 2019) and more flexible (Fletcher and Griffiths, 2020). Because of the multitude of interdependencies with resources that are under constant negotiations (Solberg, Traavik and Wong, 2020), the organizations present a dynamic feature. The process of digital transformation is represented as a period in which entities are transformed and new business models and business practices are formed'. It is a 'change in income creation strategies, application of a flexible management model standing against competition […], a process of reinventing a business to digitise operations and formulate extended supply chain relationships' (Ulas, 2019), and the 'most pervasive managerial challenge for incumbent firms of the last and coming decades(Nadkarni and Prügl, 2021). This process helps SMEs to enhance their competitiveness in local and global markets, even though their needs in the digital transformation process can vary. First of all, it is important for to SMEs perform such a process and to become attractive for the ubiquitous connected consumer (Dinesh, 2015; Shah and Loiacono, 2016; Stephen and Ahmad, 2017). The capabilities of firms are key factors and the whole transformation process depends on a data-oriented management model.

This is the reason why the author of this paper introduces the Analytic Processes Maturity Model based on the framework that divides analytic processes into six areas, namely, building analytic models, deploying analytic models, managing analytic infrastructure, operating an

analytic governance structure, providing security and compliance for analytic assets, and developing an analytic strategy (Grossman, 2018). The issue that companies are facing nowadays relates to the need to first understand the current maturity of the business. Digital Maturity is a phenomenon that has emerged along with the digital economy and Industry 4.0 (Ku, Chien and Ma, 2020; Ryan et al., 2020) and thanks to the scientific enrichment that researchers (Aslanova and Kulichkina, 2020; Rossmann, 2018) made, new definitions of the concept are introduced based on specific elements (strategy, organization, people, technologies, data, etc). For example, Aslanova and Kulichkina, 2020 presents in their paper the definition of a digital maturity level that meets the data element describing it as a 'proper usage and management of data that represents the basis of digitalization, which includes the harmonization of data creation and generation, as well as other related processes'. During the digital maturity process' resolution, a framework named AHMM is proposed by Grossman, 2018. It is based on common challenges and confusions that organizations face when they are deploying analytic models (problems obtaining the data necessary for building models, problems deploying them, quantifying the generated business values using the models, or not understanding the differences between the outputs of models and the actions that are necessary to achieve business goals). The main purpose of the digital transformation process is to redesign the structure of the business model to achieve productivity enhancements, cost reductions and innovation. Particularly, the digitally transformed SMEs can survive more time on a global market, meeting the connected consumer's requirements, competing with mid-large companies and digitally mature.

2. MATERIALS AND METHODS

Starting from the digital transformation process's significance presented in the literature review, the author considered the analytic maturity evaluating framework and the analytic processes maturity model (APMM). Afferent levels of digital maturity are the criteria for the analytic hierarchy process (AHP) to discover which of the five levels of maturity contributes the most to digital transformation.

2.1. The analytic processes maturity level

The APMM is mentioned in other studies (Grossman, 2018; Król and Zdonek, 2020; Saravanabhavan, Raman and Maddulety, 2020; Shameem et al., 2020) and it highlights the state of organizations' digital maturity. It was introduced in this research paper to extend it and to present new business and management proposals. Based on common challenges that organizations face when developing and deploying an analytic model (Table 1), the APMM compounds six basic concepts with their key processes (Table 2).

Problems	Confusions
Problems obtaining the data necessary for building models.	Not understanding the difference between reports and generated from data and models built from data.
Problems deploying models into an organization's product, services and operational systems.	
Problems quantifying the business value generated by models.	Not understanding the difference between models built from data business rules.
Deployed models do not bring the business value that was expected.	
A lack of repeatability when building and deploying models.	Not understanding the difference between the outputs of models and the actions and business processes required so that products, services and operations achieve the desired business goal.
A lack of repeatability when testing and evaluating models.	
Difficulty integrating different models developed across an organization to meet the requirements of the organizations as a whole.	

Table 1 – The challenges and confusions of an organization when it develops and deploys an analytic model

No.	Concept	Key Processes
1	Analytic modelling	Building analytic models
2	Analytic infrastructure	Managing analytic infrastructure; providing data and infrastructure for building and deploying analytics models
3	Analytic operations	Deploying analytic models
4	Analytic strategy	Developing an analytic strategy
5	Analytic governance	Operating an analytic governance structure
6	Analytic security and compliance	Protecting analytic assets with the appropriate analytic security and compliance

Table 2 – APMM concepts and key processes

Based on the key processes from Table 2, the APMM showcase five analytic maturity levels (AML). Each of them is presented in Table 3. According to AML definition (Grossman, 2018), an organization of maturity level n, must also have reached analytic maturity level 1, 2, 3… n-1.

Analytic Maturity Level		Description
AML 1	Build reports	An organization with AML 1 can analyze data, build reports summarizing the data, and make use of reports to achieve goals.
AML 2	Build models	An AML 2 organization can analyze data, build and validate analytic models from data, and deploy a model.
AML 3	Repeatable analytics	A mature organization with AML 3 follows a repeatable process for building, deploying and updating analytic models.
AML 4	Enterprise analytics	An organization use analytics with common infrastructure and process whenever possible; the outputs of the analytic models optimize the goals of the organization.
AML 5	Strategy-driven analytics	A completely mature organization presents AML 5 and it has defined an analytic strategy with the overall strategy of the organization; it uses the analytic strategy to select opportunities and to develop and implement analytic processes that support the overall vision and mission of the organization.

Table 3 – Analytic maturity levels

2.2. The analytic hierarchy process (AHP)

The AHP research method was introduced in this paper to support the decision-making process regarding the most significant level of APMM when SMEs tries to provide an excellent experience to the connected consumer. The AHP model was chosen because it represents a multicriteria decision-making approach in which factors are arranged in a hierarchic structure allowing finding focused judgment separately on each several alternatives (Saaty, 1990, 2014) to find one decision that best suits the goal (Abrahamsen et al., 2020). Given the longevity of this method in the literature, the author aimed to revify it, especially due to the recent studies that mention it (Abrahamsen et al., 2020; Darko et al., 2019; Kutlu Gündoğdu et al., 2021; Leccese et al., 2020; Şahin, Ocak and Top, 2019; Yap, Ho and Ting, 2018). The AHP supposes to organise a decision problem arranging the factors that are important for the decision in a hierarchic structure descending from an overall goal to criteria,

subcriteria and alternatives in successive levels. To mitigate the possible issues regarding what to include and where to include when constructing the hierarchies, the author provided relevant detail about the problem, the environment surrounding the problem, the issues or the attributes that contribute to the solution and the participants to the problem. The first step is to structure the problem as a hierarchy that consists of three different elements (goal, criteria, and alternatives). The first level (or top-level) is the overall goal, the digital transformation of SMEs according to the connected consumer behaviour. In the second level are the five analytic maturity levels (AML) which contribute to the goal, and in the third (or bottom level) are the alternatives evaluated in terms of the criteria from the second level.

In the second step, one derives the relatives' weights for all the decision criteria through a series of comparisons of two decision criteria at a time. A fundamental scale was used in making the comparison, consisting of judgments ranging from equal to the extreme (Table 4).

Description	Numerical Value	Explanation
Equally liked	1	Two elements contribute equally to the goal
	2	
Moderately preferred	3	Experience and judgment moderately favour one element over another
	4	
Strongly preferred	5	Experience and judgment strongly favour one element over another
	6	
Very strongly preferred	7	One element is favoured very strongly over another, its dominance is demonstrated in practice
	8	
Extremely Preferred	9	The evidence favouring one element over another is of the highest possible order affirmation

Table 4 – The fundamental scale

The methodology implies the arrangement of the elements from the second level into a matrix to lead to the third step when is prioritized the decision alternatives that conduct to the goal achievement. This is done by combining the average criterion weight with the average priority weight for different decision alternatives for the different criteria (Saaty, 1990, 2014).

According to the valuable scientific contribution published by Ulas (2019), SMEs can perform the digital transformation if one of the six described goals is achieved. Broadly mentioning, the literature review realised by him describes six layouts of different types of

SMEs categories (Appendix 1). To introduce them in the analytic hierarchy process as alternatives they were defined and abbreviated by the author as following:

1) IM-Involved Management SMEs
2) LCA-Learning Culture Adopters
3) SS-Strategic SMEs
4) DS-Digitised SMEs
5) CS-Collaborative SMEs
6) IS-Initiators SMEs

Subsequently, a content analysis was performed to match the alternatives with each of the AML from the hierarchy according to their description. Based on the result of the content analysis (Appendix 2), the hierarchy was built (Figure 1). The goal of digital transformation to ensure a good experience for the connected consumer is described by AML as criteria. The introduction of the category of SMEs reaches the study's aim to discover which of them is the most prepared for a digital transformation process.

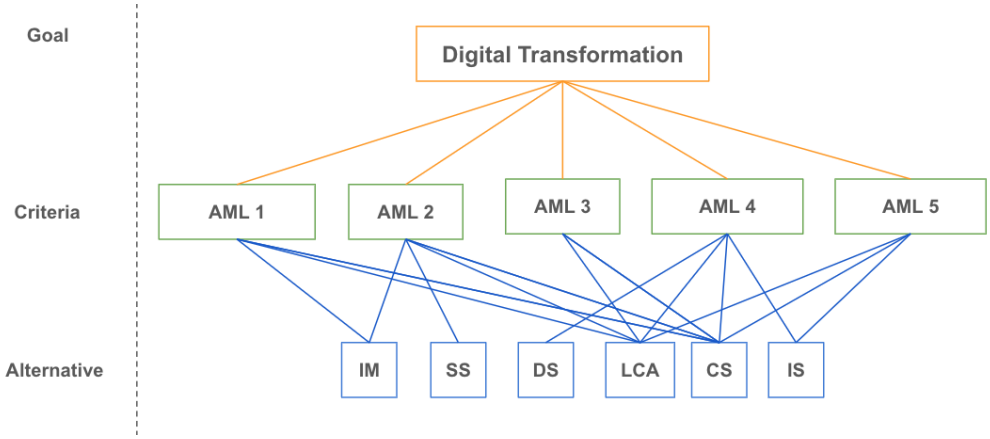

Fig. 1 – The new AHP model for SMEs' digital transformation

RESULTS

The application of the AHP approach assumes decision criteria comparison to derive relative weights according to Table 4. As it can be seen in Tables 5 to 9, a matrix is obtained for each AML, respecting all the five decision criteria at a time.

AML 1	**IM**	**SS**	**DS**	**LCA**	**CS**	**IS**
IM	1	**7**	**9**	1	1	**8**

SS	1/7	1	**6**	1/9	1/9	**7**
DS	1/9	1/6	1	1/9	1/9	**5**
LCA	1	**9**	**9**	1	1	**8**
CS	1	**9**	**9**	1	1	**8**
IS	1/8	1/7	1/5	1/8	1/8	1

Table 5 – Comparison matrix with respect to AML 1 criteria

AML 2	**IM**	**SS**	**DS**	**LCA**	**CS**	**IS**
IM	1	1	**9**	1	1	**8**
SS	1	1	**9**	1	1	**8**
DS	1/9	1/9	1	1	1	1/5
LCA	1	1	1	1	1	**8**
CS	1	1	1	1	1	**8**
IS	1/8	1/8	**5**	1/8	1/8	1

Table 6 – Comparison matrix with respect to AML 2 criteria

AML 3	**IM**	**SS**	**DS**	**LCA**	**CS**	**IS**
IM	1	**3**	**5**	1/7	1/6	**4**
SS	1/3	1	**3**	1/6	1/6	**5**
DS	1/5	1/3	1	1/9	1/9	1/3
LCA	**7**	**6**	**9**	1	1	**8**
CS	**6**	**6**	**9**	1	1	**8**
IS	1/4	1/5	**3**	1/8	1/8	1

Table 7 – Comparison matrix with respect to AML 3 criteria

AML 4	**IM**	**SS**	**DS**	**LCA**	**CS**	**IS**
IM	1	**4**	1/8	1/8	1/8	1/7
SS	1/4	1	1/9	1/9	1/9	1/9
DS	**8**	**9**	1	1	1	1
LCA	**8**	**9**	1	1	1	1
CS	**8**	**9**	1	1	1	1
IS	**7**	**9**	1	1	1	1

Table 8 – Comparison matrix with respect to AML 4 criteria

AML 5	**IM**	**SS**	**DS**	**LCA**	**CS**	**IS**
IM	1	**3**	1/8	1/8	1/8	1/8
SS	1/3	1	1/7	1/9	1/9	1/8
DS	**8**	**7**	1	1/4	1/4	1/5
LCA	**8**	**9**	**4**	1	1	1
CS	**8**	**9**	**4**	1	1	1
IS	**8**	**8**	**5**	1	1	1

Table 9 – Comparison matrix with respect to AML 5 criteria

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The next step is to calculate the average criteria weight The AHP software was used to generate the results (Table 10).

	AML 1	AML 2	AML 3	AML 4	AML 5	Result
IM	0,1534	0,0633	0,0126	0,0020	0,0008	**0,2322**
SS	0,0440	0,0633	0,0086	0,0011	0,0005	**0,1176**
DS	0,0202	0,0162	0,0029	0,0119	0,0026	**0,0539**
LCA	0,1661	0,0466	0,0432	0,0119	0,0062	**0,2740**
CS	0,1661	0,0466	0,0413	0,0119	0,0062	**0,2721**
IS	0,0119	0,0160	0,0043	0,0116	0,0065	**0,0503**

Table 10 – Overall average criteria weight

The relatives' weight obtained showcase that a learning culture adopter SME (LCA) is the leading alternative when digital transformation is needed (Figure 2), followed by collaborative SME (CS). That means that two types of organizations can digitally transform more easily than the others included in the study.

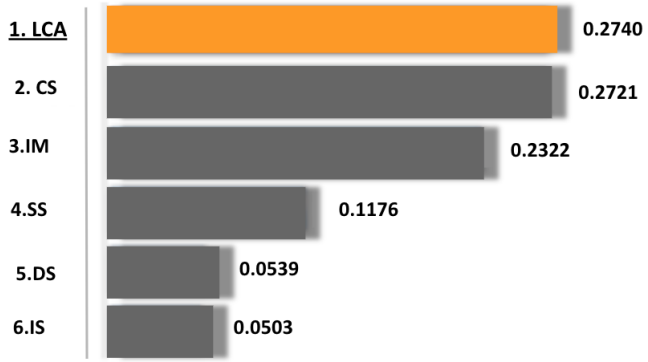

Fig. 2 – Decision

Source: AHP Software

Based on criteria importance results (Appendix 3), Figure 3 pictures that AML 1 has the greatest contribution to digital transformation.

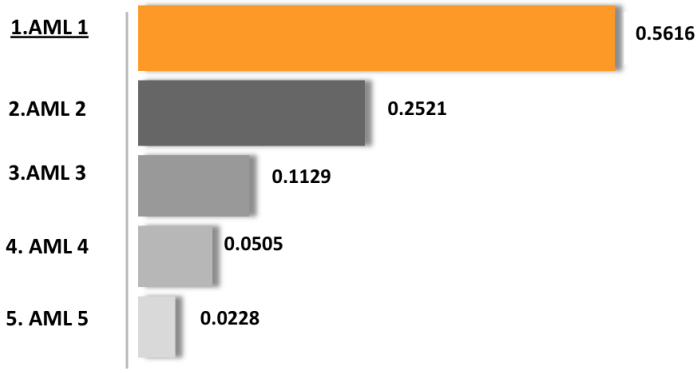

Fig. 3 – Criteria importance

Source: AHP Software

The rankings of the alternatives with the structure are pictured in Figure 4 that presents the overall contribution for each alternative based on chosen criteria.

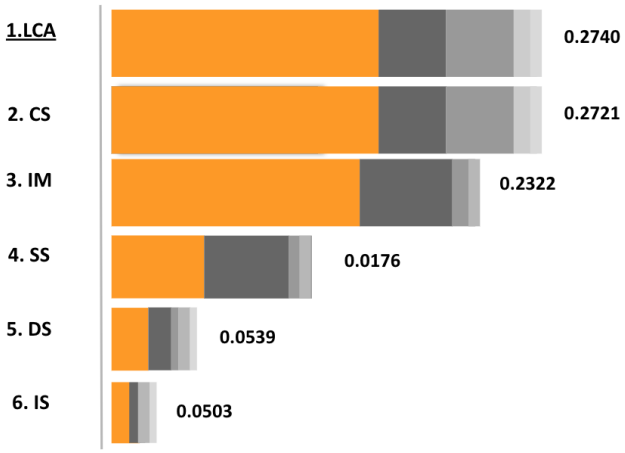

Fig. 4 – Alternative rankings with structure

Source: AHP Software

DISCUSSION

Starting from the question 'How can we ensure meaningful moments for connected consumers in global markets (Stephen and Ahmad, 2017)?', the author tried to answer this question through the process of digital transformation of SMEs. Understanding the connected consumers will be crucial for the online world (Shah and Loiacono, 2016) in the next decades and Data Analytics will play a vital role (Moorthi et al., 2021), as well. The conducted study aimed to help the SMEs digitally transform more easily and to provide a better experience to

connected consumers. This is possible by identifying which is the priority for an organization when it has to initiate a transformation process.

First of all, understanding the current maturity of the business will challenge the management to enhance its competitiveness in local and global markets, despite any need. Grossman (2018) defined the analytic model level and pointed that an organization has to reach one by one the levels of digital maturity. The results of the study extended his theory highlighting that by reaching the first and the most important analytic maturity level, the organization will be able to redesign the structure of the business model to achieve digital transformation and obtain productivity enhancements, cost reduction and innovation, from one level of maturity to another. In other words, according to the new digital transformation model, building reports (analyze data, build reports summarizing the data, and make use of reports to achieve goals) has the most contribution to the digital transformation of an organization. If the first step in the digital transformation journey is done, the confusion when deploying an analytic model is mitigated because of good practices and operations regarding building reports.

Secondly, the use of SME categories review that Ulas (2019) published, allowed the author to create a new model for SMEs' digital transformation using analytic hierarchy process by introducing them as alternatives. The learning culture adopter SMEs is the alternative the most prepared for a transformation process, the results engendering proposals for management and marketers. According to LCA SMEs' category description, adopting the 'learning culture' is essential for the digital transformation of operations. The changing world and society need skilled and educated current employees to be able to detect gaps. SMEs need to compete with new markets to become attractive for the ubiquitously connected consumers and to match the digital marketing campaigns with their needs.

Using the generated data, the built reports, and the learning culture practices, an organization is not only properly prepared for a digital transformation to the next level of maturity, but it can be progressively adapted to the digital activity of the consumers, offering personalized services, obtaining notable advantages, and becoming more competitive and flexible.

CONCLUSIONS

The author proposes a new model for digital transformation using the digital maturity concept and the different categories of SMEs as alternatives within an analytic hierarchy process

analysis. The paper aimed to highlight what types of SMEs are prone to a digital transformation process in terms of digital maturity and what level of analytic maturity contributes the most to the process. The extension of two theories, namely, the analytic processes maturity model and analytic hierarchy process put forward the scientific value of this study.

The paper adds value for managers and marketers pursuing to enhance the competitiveness of SMEs in process of digital transformation, desiring to learn what to prioritize with respect for the connected consumer digital and active life. The author states for involved management analyze the current situation of the digital maturity level of the organization and deploy operational procedures to analyze data, build reports summarizing the data, and make use of reports to achieve the business goals. Also, the management must inspire employees with learning culture activities and measure them with key performance indicators. That will ensure the needed competitiveness and new opportunities for SMEs to grow.

The theoretical implications represent the application of the new model proposed to understand which is the challenge that SMEs faces and where to start to digitally transform from. These organizations must digitally engage with the connected consumers, starting from the digital maturity level reaching a complete transformation process.

A first limit of the elaborated research is the secondary character of the data source (reviews) that does not ensure a representative population studied. Likewise, a small number of SMEs categories are included in the research. By increasing it the results can become more truthful. Another limit can represent the selection of the two theories that are extended, not a study based on empirical research.

The research perspective proposed by the author is closely related to the limits of the conducted study, but also the results obtained. Qualitative research is needed to understand the perspective of the SMEs in front of the digital maturity levels and a focus group can be conducted to discover how the SMEs are posing toward data tracking and analytics when building analytic models in organizations. On the other hand, quantitative research can explore the attitudes of the connected consumers toward SMEs categories and their tendencies to digital transformation. Research is needed to adopt an omnichannel, as well, to meet the connected consumer behaviour across multiple touchpoints especially when delivering personalized digital marketing campaigns.

CONFLICTS OF INTEREST AND PLAGIARISM: The authors declare no conflict of interest and plagiarism.

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APPENDIX 1. SME category review

SME category defined by author	Description
Involved Management SMEs	'Transformation must be led by the owner or manager. It is required that the management is asking for data-based digital transformation, to be determined who will be responsible what for. SMEs current situation needs to be analyzed to identify challenges, risks, or changing customer expectations. SMEs with the requirements and needs analysis, which enables them to clearly define measurable goals. The management can review digitalization topics and what new technologies can contribute and explore new business models. And then offer benchmarks and training to support SMEs',
Learning Culture Adopters SMEs	'Adopting of 'learning culture' in SMEs is essential for the digital transformation of operations. The world and society are changing at an unprecedented pace. It is needed to have skilled employees, educate the current employees, create an inventory of required abilities and skills and detect gaps. It is vital to compete with new markets as Google, Amazon, Facebook, Apple. Employment of people who have digital skills should be taken into

	consideration (IT specialists, and socioeconomic support professionals)'.
Strategic SMEs	'Defining a simple roadmap of business goals or digital transformation: Based on the digital transformation, objectives with regards to digital transformation are defined. These objectives relate to time, finances, space, and quality (design SMEs new digital strategy, analysis of SME's existing business model, customers requirements, digital evaluation and expectations, set objectives, competence development, collection of best practices for digital transformation, design digital business models options, information technology use and understanding, evaluation, design of digital value network, feedback from customers)'.
Digitised SMEs	'Creation of awareness of digital and a supportive environment. 'To use IT to develop my enterprise'; 'To measure the impact of IT tools (e.g. ROI, sales, performance)'; 'To link my expectations with the reality of apparent user-friendly IT turnkey platforms'; 'To be better informed about available IT training'; and 'To establish transparent communications between entrepreneurs and IT specialist about expectation and deliverables to avoid a deception'.
Collaborative SMEs	'Collaboration with SME helpers, innovation labs, research institutions. In order to realize the digital transformation, it may be helpful to consult with companies that have expertise in this field and to obtain consultancy services. Guiding the SMEs through current trends and demonstrate their importance based on practical examples (best-practice, real-life examples)'.
Initiators SMEs	'Support SMEs with the requirements and needs analysis, implement feasible objectives. It is essential that SMEs which ask for digital transformation should be supported by governments. With the aid of government agencies and other stakeholders such as the Trade Association and Chambers, SMEs may be better able to access more assistance in their digital transformation process. Also, external supporters such as competence centres or

	research institutions can help SMEs to understand and implement digital transformations initiatives.

APPENDIX 2. Content analysis results

SME Category	Analytic Maturity Level Match
Involved Management SME	AML1; AML 2
Strategic SME	AML 2
Digitised SME	AML 4
Learning Culture Adopter SME	AML 1, AML 2, AML 3, AML 4, AML 5
Collaborative SME	AML 1, AML 2, AML 3, AML 4, AML 5
Initiators SME	AML 4, AML 5

APPENDIX 3. Criteria importance results

	Result
AML 1	0,5616
AML 2	0,2521
AML 3	0,1129
AML 4	0,0505
AML 5	0,0228