Methodology for assessing innovation maturity and readiness of tourism SME

Work Package 3

SMEs Anamnesis, Diagnostics and Assessment

Deliverable 3.1. Methodology for assessing innovation maturity and readiness of tourism SMEs

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1. Introduction: main objectives of WP3

After having selected a number of European tourism SMEs to be awarded the financial support and to be involved in the Euro-Emotur project (Work Package - WP 2), Work Package 3 aims at developing and implementing an in-depth investigation into these businesses, through a multistep diagnostic process. The aim of the diagnostic process is to collect information useful to have a picture of the state of the art, to understand their needs (expressed and tacit) and their ability to evolve. All these elements will be crucial to develop a user-friendly self-assessment tool for SMEs, which is one of the main outputs of this WP, as well as to inform support and mentoring activities planned in WP4 and the setting up of the Euro-Emotur Digital Lab (WP5).

Through the activity of WP2, 100 tourism-related SMEs will be selected through an open call, according to a set of quantitative and qualitative criteria (Capability, aptitude and interest; Successful applicant profile; Geographical scope; Reach and sustainability). 20 selected SMEs will be located in each pilot cluster (Canary Islands, Veneto and Lapland-Helsinki) and 40 SMEs in other EU countries.

As defined in the Euro-Emotur project proposal, Work Package 3 aims at developing and implementing an in-depth investigation into the businesses that have been selected in Work Package 2. The in-depth investigation implemented in WP3 will allow to:

- check the state and the level of the SMEs digital technology transformation and of innovation uptake;
- assess their digital readiness and maturity to adopt new tools or to implement new strategic approaches supported by the knowledge created by the application of innovative tools;
- identify the critical factors that may make difficult or hamper the introduction of the innovation in online communication functions brought by the results of the *neuromarketing analysis*;
- identify the needs of the SMEs in terms of training to support them in the exploitation of the new knowledge and tools provided at the end of the project;
- help to define the content and target for the training;
- help to define the content of the communication plan provided to the SMEs as an output of the project, suggesting not only changes in the online communication approach but also changes needed for the organisation to fully exploit and sustain the innovative approach, after the end of the project.

The focus of the analysis will be, in particular, on technologies that help tourism-related SMEs to empower their digital positioning and reputation on the web through different channels, such as websites, social media platforms, travel platforms and OTAs, etc.) A set of diagnostic tools will be implemented to assess, directly and indirectly, the current situation of SMEs

and their potential capacity to evolve from different perspectives, These tools are a desk analysis of the SME website and of its presence on OTA and other platforms and on main social networks, but, mainly:

- an online survey with the 100 selected SMEs awarded for financial support;
- in-depth interviews and participant observation of some of SMEs involved in the previous step.

The results obtained will support the other project activities but also the building of a self-assessment system for tourism SMEs, which represent one of the main outputs of the Euro-Emotur project. The tool will remain available for other projects and for all tourism businesses in the EU that wish to evaluate their openness to innovation and their ability to embed it in their organisation.

This Deliverable describes the methodology that will be the ground to develop the structure and the contents of the diagnostic tools that will be used to assess the digital maturity and readiness of the selected SMEs (the online questionnaire, the guidelines for or participant observation and direct interviews).

This document is divided into 2 parts:

1. A more operational and synthetic description of how the diagnostic tools will be designed, applied and reviewed within WP 3 (Chapter 2 and 3)
2. An appendix discussing more in detail the methodological approach behind the diagnostic tools design, the literature is based upon, and some of the more technical aspects of the assessment tool

2. Designing WP3 diagnostic tools: key aspects

2.1. Objectives of the diagnostic tools and of the methodology

As described above, the main aim of WP3 is to assess the status of each of the SMEs selected in WP2 regarding their digital technology and innovation uptake to allow the partnership to better define their needs, guide them and mentor them through the father activities of the Euro-Emotur project they will be involved in.

This assessment is important because the adoption and effective implementation of digitization and innovation is still a major challenge for SMEs both in the industry and in the service sector, which also includes SMEs along the tourism value chain. This issue remains, although several efforts in research/professional consultancy and knowledge transfer (from theory to practice) have already been carried out at EU and national level in the last years. One of the main related issues is that many small and medium enterprises are not aware of the type and potential of technologies and tools they use, or/and are not able to fully exploit the potential of platforms (e.g., inability to read the analytics, reviews unanswered, no understanding of SEO/SEM, etc.). In addition, they refuse to adapt to the new environment even when forced to use it (e.g., use of static pricing for online B2C channels). Trying to investigate the reasons behind this difficulty in fully adopting innovation, it emerges that the problem is related to business succession (CISET, 2011; Elmo et al., 2020; Getz e t al., 2005; Lee et al., 2017; Mingotto et al., 2020) and to a lack of competencies both of entrepreneurs and some managers (CISET, 2015; Najda-Janoszka & Kopera, 2014). These gaps apply to a great variety of technologies used in various operations (PMS, CRMS, F&B support tools, booking engines, etc.) including the creation, design, content and management of the website, and the content and management of social media and review portals. Regarding this last topic, website development is focused only on the point of view of the web agencies and of the SMEs owner, while the client/user's preferences are not taken into consideration and the impact of the user experience on conversation rates is often ignored (Montaguti, 2016).

Therefore, the 100 SMEs selected by the Euro-Emotur project cannot be expected to be at the same level concerning digital innovation, and thus expressing similar needs and expectations concerning the activities in WP4 and 5. Therefore the assessment of each SME provided though WP3 diagnostic tools will on the one side, support the Euro-Emotour partnership activity, on the other, help the SMEs to choose and access the training and services provided by WP4 and WP5 more apt to their specific situation, and their ability to intake and implement digital innovation.

More in detail, the analysis implemented in WP3 will provide the partnership:

- a deeper understanding of the SMEs selected to take part into the project, in terms of their approach to digital marketing, openness to

innovation, knowledge of neuromarketing which is the main innovation the project aims to introduce the tourist businesses to;

- the possibility to provide a tailored mentoring and support to each of them in the training and also in the access to digital services, according to their specific features, their attitude towards innovation and the obstacles that could prevent them to really implement new services or approaches;
- a first step in the mentoring of the tourism businesses.

To do this, WP3 will implement a set of diagnostic tools that will allow the partnership to assess each SME on the same common basis:

- online survey with the 100 selected SMEs awarded for financial support (D.3.2);
- in-depth interviews with the 60 SMEs located in the partners' regions, and participant observation of 30 out of the 60 SMEs involved in the previous step (D.3.3).

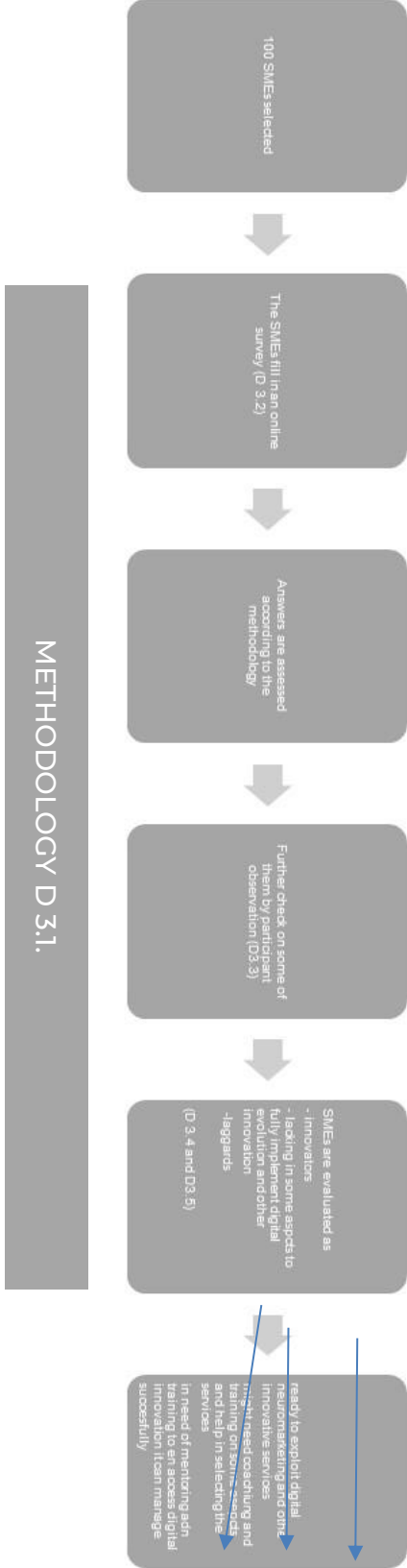## 2.2. WP3 diagnostic tools: aim and role in the project

As anticipated above, the results obtained will support the other project activities, and, in particular, WP4 and 5, and therefore the diagnostic tools will be used to assess the SMEs immediately after their selection in WP2, as follows:

- after being selected, each SME will be invited to fill in a questionnaire (D3.2) available online, aimed at understanding how innovative and digitally mature it is: the questions included in the survey are defined in the methodology here presented;
- according to same methodology, each answer provided by the SMES will be assessed and thus the overall approach and performance of the SME in relation to digitisation and innovation will be explored;
- once the questionnaires are analysed 30 SMEs of the 3 main clusters (Veneto, Canary Islands, Finland) will be selected for a further investigation realised through participant observations sessions - representatives of the Euro-Emotur partnership will access the premises to observe specific behaviours according to a common protocol (D 3.3:) defined on the basis of the same methodology here described - the participant observation will focus on those business that provided ambiguous or contradiction answer to the online survey;
- on the basis of the answers provided to the survey and - for a smaller group - of the behaviours observed directly, it will be possible to understand if a business is innovative, an imitator, willing to uptake more digital services by lacking in some key area, or is a laggard and has difficulties in uptake digital transformation or other kind of new approaches;
- this information will allow the partnership to know, in advance, which of the 100 selected SMEs will be ready and quick to acquire and implement the digital neuromarketing approaches and other technologies presented in WP4, which are less ready and so might be in need of more mentoring or advised to participate more in training activities in WP5,

and where are their specific weaknesses (lack of skills of the personnel, digital marketing entirely depend from an external digital provider, etc?), and which are struggling more than the others so might need to even more mentoring and directed into choosing the right kind of digital solutions.

Figure 1. The methodology and the diagnostic tools role in WP3

METHODOLOGY D 3.1.

- 100 SMEs selected
- The SMEs fill in an online survey (D 3.2)
- Answers are assessed according to the methodology
- Further check on some of them by participant observation (D3.3)
- SMEs are evaluated as
  - innovators
  - lacking in some aspcts to fully implement digital evolution and other innovation
  - laggards
  (D 3.4 and D3.5)
- ready to exploit digital neuromarketing and other innovative services
- in all need coaching and training on some aspects and help in selecting the services
- in need of mentoring adm training to en access digital innovation it can manage successfully

The analysis will not only provide the results described above - so basically the ground to tailor the activities of WP 4 and 5 to the business needs, but also the building - on the basis of the online survey - of a self-assessment system for tourism SMEs, which represent one of the main outputs of the Euro-Emotur project (D3.2). Once tuned in through the analysis of the 100 SMES, the online survey will be supported by a system that automatically assesses the answers provided and, on that basis, will be able to evaluate if the business filling in the questionnaire in is innovative, laggard, etc. and why. The assessment tool so developed will remain available for other projects and for all tourism businesses in the EU that wish to evaluate their openness to innovation and their ability to embed it in their organisation.

2.3. Structure and content of the diagnostic tools: key aspects

This Deliverable describes the methodology followed to develop the structure and the contents of the diagnostic tools (the online questionnaire - D3.2, the guidelines for or participant observation and direct interviews - D3.3) that, as presented above, will be used to assess the selected SMEs' innovativeness, and more in detail:

- the grounds which the selection of questions to be asked by the online survey in based upon - which kind of questions are we going to ask? What are the most relevant ones?
- the behaviours to be observed during the participant observation sessions - who are we going to observe? In which kind of situation? What are we going to observe?
- the basis the assessment of each of the selected SMEs is built on (and therefore of what will be reported in D3.5 and D3.4) - how do we know that a specific answer to a question or a specific behaviour indicates that the SME is digitally mature or not? How do we know that specific managerial choices will smooth or make difficult the way to innovation?

Defining all of the above required a wide scouting and research on a series of different previous experiences and studies, and an attentive evaluation on how those experiences could be applied to the tourist SMEs and to the specific aims of Euro-Emotur. The details of this research are described in the Appendix, while the basics aspects are summarised here for a more operational approach.

2.3.1. The key aspects of innovativeness: digital maturity and absorptive capacity

The previous experiences and studies examined suggest that to understand how a business approaches innovation and digital innovation more in detail, two main aspects need to be assessed:

- Its digital maturity, i.e. how much the business invested in digital tools and technology, in the training of its personnel, and how much digital development is embedded in the business model and business development plans;
- Its readiness, or absorptive capacity, i.e. it ability to acquire and implement innovation coming for the external environment (digital

providers, universities, research centres, other businesses).

Digital maturity, in particular, has been explored by a series of experiences described in academic and professional literature, as well as in EU projects. Many assessment tools have already been developed to evaluate the digital maturity of larger companies and SMEs, and the efficacy of some of them has already been discussed - models such as the ones analysed by Rauch et al. (2020) or listed in the Interreg Alpine Space SMART SPACE Project (Gay, 2018) or developed by the German National Academy of Science and Engineering (Acatech model, Schuh et al., 2017); or by Schumacher et al. (2016); Carolis et al. (2017); Blatz et al. (2018); Trotta & Garengo (2019); Pirola et al. (2019); Shallmo et al. (2020); Amaral & Peças (2021). More than 20 have been founded and analysed to define if they could be used within the context of Euro-Emotur and how much they needed to be adapted (See Appendix -Chapter 1 for further information on these tools). Just a few, however, have been focussed on tourism SMEs specifically.

Absorptive capacity, on the other hand, has been defined and analysed by a long series of studies, cases and experiences since the 1990s, both by academics and professionals ((Szulanski, 1996; Cohen & Levinithal, 1990, and following literature). This aspect is not usually explored in the digital maturity assessments developed by other projects, and its integration will be a specific feature of Euro-Emotur project methodology.

The reason for introducing an assessment of absorptive capacity is linked both to the specificity of some of the innovation the project aims at introducing and to the specific needs the diagnostic tools of WP 3 have to answer.

As for the first point, consumer neurosciences and neuromarketing are a cutting edge subject, which tend to defy what people think they know about customers and their decision making process, and do not concern only digital aspects: there might be barriers in transferring this kind of knowledge independent from the ones linked to the adoption of digital innovation.

As for the second point, digital maturity assessment approaches are mainly focused on the expertise and technology already acquired by the organisation, and on the role ICT play within the business' strategy, but not on how the organisation and the staff lived the "process" of receiving and implementing innovation and the difficulty they faced. However, the Euro-Emotur partnership needs to understand and foresee how the process of obtaining and implementing innovation will unfold to effectively support and mentor the SMEs. Furthermore, the introduction of neuromarketing techniques - being cutting edge technologies and approaches - will be most probably approached as a project by the SMEs involved, and the people specifically involved in projects play an important role in enabling knowledge transfer and assimilation (Oti-Sarpong & Leiringer, 2021). However, none of the models assessing digital maturity takes this aspect into consideration, while absorptive capacity-based analysis consider the role of the so called "gatekeepers", as explained in the following paragraph.

2.3.2. Understanding if a business is innovative and digitally mature: Relevant aspects or dimension to be explored and how to assess them

The previous experiences and studies analysed to design the WP 3 diagnostic tools define also which are the aspects or dimensions of the business activity, organisation and modus operandi that need to be explored to understand if a business is digitally developed and able to intake for the innovation.

The detailed analysis of on why and how the relevant dimensions to be explored have been selected to be included in the Euro-Emotur diagnostic tools, and of the sources attesting their relevance are discussed in the Appendix, while here the main results of the analysis are presented.

The analysis of the existing digital maturity assessment tools shows that to understand if a business is digital mature the main dimensions - i.e., the one the all the assessment models consider - to be explored are:

- **ICT infrastructure, resources and use** - It represents a key technical component and it refers to the availability and use by the business of infrastructures and tools for processing wide volumes of data and guaranteeing interconnectivity
- **Strategy and leadership** – willingness to invest in digital services and to integrate the digital strategy with the general business strategy - how much did the business invest in ICTs in the past? how important is digitalisation in business development plans?
- **Processes and products** – It first of all refers to how much the internal activities are supported and optimised by IT, automation or even AI, and secondly on the digital services and accesses provided to the customers to support their experience and the relationships with the business itself, and also to collecting and processing data on product utilisation and clients' preferences.

- **Data awareness** – It deals with the acknowledgement of the "value" of data, and how much data available to the business (e.g. web analytics data, Customer Relationship Management Systems data, etc.) is collected, analysed, and assessed in order to exploit information
- **Skills** – This dimension refers to the set of knowledge and competences about ICT and digitization the personnel possess, and how often digitization related skills are updated by specific training
- **Digital enablers (external)** - It focuses on the relations with external digital service providers and partners supporting the business in implementing, managing and maintaining new ICT solutions, and more in detail on understanding if the main drive in this relationship is to constantly acquire or develop new solutions; or just maintenance

As for digital readiness, this is intended, as sais, as absorptive capacity and, according to the vast literature on this theme (see Appendix - Chapter 1) the aspects or dimensions most relevant to understand if a business is able to "absorb" innovation are:

- **Critical knowledge** - this aspect refers to the fact that it is easier to acquire an innovation if a business or someone within the business is already aware of what that innovation is and how it works - in the specific case of the Euro-Emotur project neuromarketing is a key knowledge the SMEs' selected to take part in the project should be familiar with. Therefore, their awareness about neuromarketing will be explored, but also their internal knowledge about websites, e-commerce and digital marketing

- **External communication & networking** – Since absorptive capacity is higher and the transfer of knowledge easier when a business has a dense and well-established external network of partners, it is important for the Euro-Emotur project will explore the whole network of relationships that the business have developed and consolidated over the years,

- **Cross functional communication - Differentiation of expertise within the team** – The diversity of knowledge – technical but also soft skills - available among the employees of a business plays an important role in supporting the learning process. According to the previous experience and studies, a diversified background provides a solid basis in the transfer of new knowledge, and it helps to better recognize its value. Therefore, the Euro-Emotur questionnaire and assessment will explore how differentiated is the background of the non-seasonal staff of the SMEs selected to take part into the project

- **Cross functional communication - Characteristic of the communication** – the formal and informal opportunities available inside the business for supporting the communication and exchange of information between the different departments (or individuals), such as policies aimed at rotating employees, involving cross functional teams in project

development; or the availability of digital tools for team and cross team communication

- Gatekeepers - internal gatekeepers refer to those figures who act as facilitators for the business in the finding new approaches and tools – in this case digital and neuromarketing related knowledge - from the external environment. They can be the employees in charge of the relationship with digital service providers and other partners, or responsible for digital marketing, website development, etc. It is important to assess the skills, role and level of responsibility inside the organisation of these employees. If already identified, specific attention will be dedicated to the persons who will be in charge of the Euro-Emotur project itself within each of the selected SMEs.

Figure 2. Digital maturity and Absorbitive capacity: main dimensions
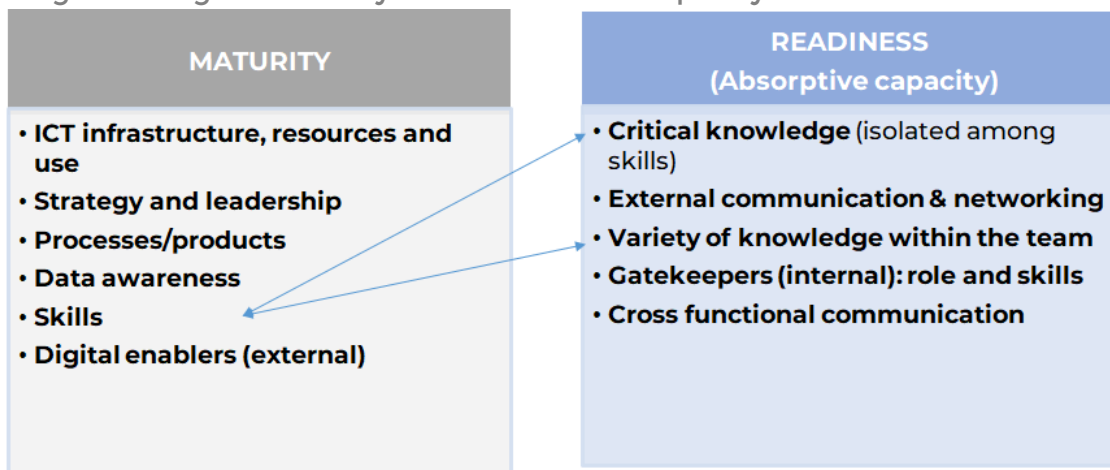
2.3.3. From the questions to the indices

The previous studies and cases not only define which aspects are relevant to explore if we want to understand how a business approaches digital development and innovation, but also which organisational behaviours in relation to that aspects are more conductive to innovation.

For example, the previous studies verified that the ability of a business to absorb innovation and implement it strictly linked to the fact that the communication between different units and functions (marketing, administration, room division, etc.) being fluid. Various cases explored by academic and professionals demonstrated that businesses performing very well on this aspect rotate the personnel periodically and involve their staff in training activities dedicated to a mix of people working in different units. Therefore, in this case having a policy of rotating personel and of guaranteeing periodic transversal training activities are behaviours conductive of a good internal communication and thus might help the business to be quicker to implement innovation.

On this basis it is then possible to define:

- which kind of questions is important to ask the 100 SMEs , as each question is going to explore a different component of the relevant aspects;
- which kind of behaviours is needed to observe when we observe directly (participant observation D 3.3);
- How to interpret the answer the SMEs will give to those questions in the light of their approach to digitalisation, assessing if the behaviour they describe is positive, or negative in relation to the innovation intake;
- a "score" for each answer or a score correlating the answer to 2 questions;
- a comprehensive score (index) for each aspect as the result of the scores registered in each question exploring that dimension;
- a comprehensive score for digital maturity and absorptive capacity, and therefore;
- understanding if that business tends to be innovative (performs well on the different dimensions explored), it is innovative only concerning certain aspects but need to work on others (good scores on certain indices) is a laggard not that good in exploring and implementing digital innovation.

Figure 3. Example of how an index can be calculated - Internal communication
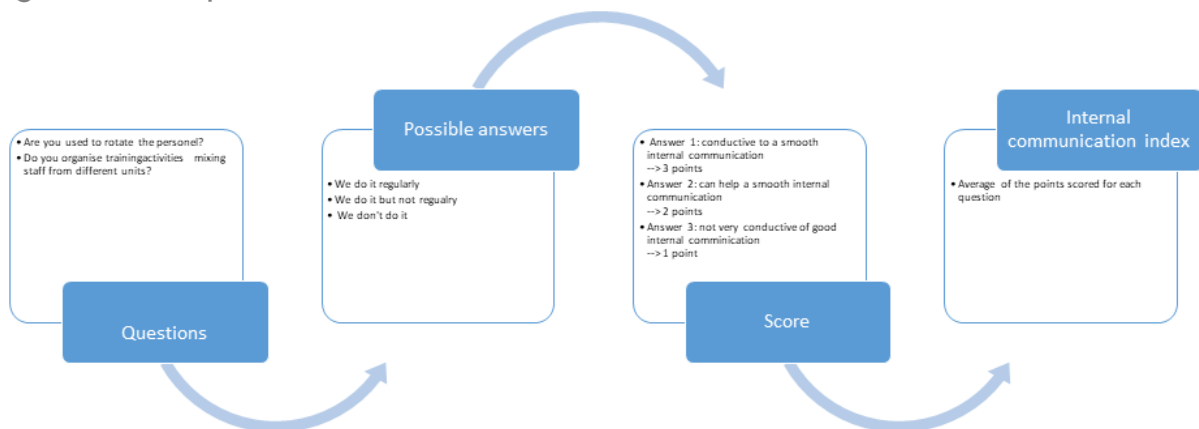
Specific questions selection, the score for each answer, and how each index will be calculated is presented in D 3.2. Here is a first tentative list of the aspect to be explored and the possible indices (more detail on the choice or possible calculation of the indices in the Appendix, Chapter 2) that will be included.

Table 1. Questionnaire structure and Maturity/Readiness indices calculation

Questions of the only survey	Dimension index	Overall index
N. 1, n. 2	Strategy and leadership:	

		MATURITY **MEAN OF THE 6 DIMENSIONS INDICES**
	simple mean of the scores obtained answering the questions	
3,4	Digital enablers: *simple mean of the scores obtained answering the questions*	
5,6	Skills: *simple mean of the scores obtained answering the questions*	
7,8,9	Data awareness: *simple mean of the scores obtained answering the questions*	
9,10	Product/Process: *simple mean of the scores obtained answering the questions*	
11,12	ICT infrastructure, resources and use: *simple mean of the scores obtained answering the questions*	
13,14	External communication: *simple mean of the scores obtained answering the questions*	READINESS **(Absorptive capacity) (Weighted?) MEAN OF THE 5 DIMENSIONS INDICES**
14-17	Expertise differentiation *simple mean of the scores obtained answering the questions*	
18,19	Internal communication: *simple mean of the scores obtained answering the questions*	
20-23	Critical knowledge: *simple or weighted mean of the scores obtained answering the questions*	
24-26	Gatekeepers: *simple mean of the scores obtained answering the questions*	

The number of questions per each dimension and their order are for example

Starting from these set of indicators, a first model of the assessment tool will be designed, which will be reviewed and improved once the analyses will be carried out and the results collected and elaborated, and will eventually evolve into the fully developed self-assessment tool.

3. Applying the methodology to develop the assessment tools and analysis the business within the Euro-Emotur project: the next steps.

In order to develop the investigation tools (online questionnaire and a related system to assess the answers - basic version of D3.2 -, participant observation protocol - D3.3), apply them to assess the 100 SMEs selected to participate in the project, use them to cluster and analyse the situation of the selected business with respect to maturity and readiness (D3.5) the partnership will need to carry out a series of activities that descend from the methodology illustrated in this document. The following paragraph illustrates

- these activities grouped in 8 steps that constitute the various phases of application of the methodology and, basically, also the work flow of WP3
- the "check points" where the online survey is reviewed and revised if needed
- the role of each WP3 deliverable and its connection to the others and the methodology presented here

Along the various steps described in the following paragraphs the role of the Euro-Emotur partner organisations will be the following;

- all the partners will be asked to check and comment on the online survey and the assessment of the answers (D.3.2.), and the participant observation protocol (D.3.3.) realised by CISET, that is the leading partner of WP3;
- the partners will provide support to the SMEs, if needed, and check that they fill in the online survey, and provide feedback on this process;
- ULPGC, CISET and Haaga Helia researchers will be in charge of the participant observation sessions;
- CISET will process the results of the online survey and, together with ULPGC and Haaga-Helia, the results of the participants observation, while the other partners will provide support and feedback on the results
- CISET will lead and set the main design and content of the Report on the digital tools used by SMEs, digital content produced, and their online performances (D.3.4.), and the report on the SMEs pool situation in terms of maturity and readiness to adopt innovation, including indications on the training needs (D3.5) , and all the partners will support in the realisation of both reports

3.1. Developing and applying the tools: next steps

Step 1: Development of the assessment questionnaire

As illustrated above, the first step in applying the maturity/readiness

assessment system presented in this document will be the development of an online questionnaire that will allow to analyse the approach and performance of the 100 tourism SMEs selected to participate in the Euro-Emotur project with respect to the different dimensions of maturity and readiness as described in the previous paragraphs (Strategy and leadership, Critical knowledge, Gatekeepers role, Staff skills, etc.). One or more questions will be dedicated to exploring each dimension. A set of closed pre-compiled answers will be defined for each question. The answers will describe various degrees of "negative" or "positive" behaviours with respect to that specific dimension or sub-dimension. What constitutes a positive or negative behaviour is drawn from the literature and applications described in this document.

For example, to understand what the situation of a business about the differentiation of expertise is, one of the questions to be asked might be if the business recruits personnel with different backgrounds. As described in paragraph 2.2. all the cases analysed and described in the literature about innovation and absorptive capacity demonstrate that the more the staff has different knowledge and experiences the higher is their expertise differentiation and the ability of the organisation to acquire and implement innovation. Therefore, the set of answers to the questions will range from "they have the same background" (a behaviour not conductive to innovation) to "we recruited people with many different backgrounds" (an approach to create an innovative business environment).

Step 2 The scoring and indices calculation system

Based on what is considered an innovation-oriented (positive) - or not - behaviour, a score will be attributed to each answer. Goin back to the previous example about expertise differentiation, the innovation-oriented answer (recruiting people with different backgrounds) will be awarded 5 points, while the conservative one (same background) will be assigned just 1 point.

Once a score is attributed to each answer to each question, it will be possible to develop a first calculation system for all the indices measuring the performance on each dimension impacting digital maturity and readiness: in a first hypothesis the scores obtained in each question related to the same dimension will be added and divided to calculate the average value per each dimension. Continuing with the previous example, if on the question regarding staff background a business obtained 5 points and it obtained 4 points answering a question concerning how distributed the employees are between the various units - which is another aspect impacting the dimension "Differentiation of expertise" - its average score on expertise differentiation will be 4.5.

Once every answer to every question has been assigned a score, it will be possible to create a first system to calculate the sub dimensions and dimension indices that will measure the performance of each of the Euro-Emotur involved businesses regarding that dimension.

Therefore, in our example, the 4.5 score on Expertise differentiation will sum up with the score about Critical knowledge - built in the same way - and in such a way define the Readiness/Absorptive capacity total score.

Step 3 The participant observation protocol (D3.3) and the in-depth interviews

On the basis of the methodology presented here, the partnership is going to develop not only the assessment questionnaire described above but also a protocol for participant observation. Participant observation is a research method originating from ethnography but used also in management to understand better how organisations work and how people within them interact. For this reason, it will be particularly interesting to use it to deepen the knowledge of the SMEs selected to participate into the Euro-Emotur project. The participant observation will allow the partnership to understand what the organisational culture is, the personnel's actual attitude towards innovation, the leadership style, and many other aspects. A better understanding will make possible, on the one hand, to give a context, and a better interpretation to the answers provided to the questionnaire, verifying also if there are embellished answers, and, on the other hand will permit the researchers to start to get to know better at least a part of the business they are meant to work with in the following months and to personalise better the consultancy on neuromarketing and the training activities (WP4 and 5).

The participant observation protocol (D3.3) is going to be developed in its key aspects before the selection of the 100 SMEs and then detailed for each kind of business (travel agency, hotel, camping, etc.) once it will be clearer how the group of selected business is composed, and also how many of them are micro-enterprises, small or medium ones, as this impact on the specifics of the protocol. The protocol will envisage also an exploratory visit before the actual observation sessions, which will be complemented with an in-depth interview to the owner/CEO/senior management, also a part of D3.2.

Step 4. The online questionnaire is filled in by the 100 tourism SMEs and their performances measured.

Once all the tools are developed and the selection process in WP2 finished, the 100 SMEs selected will be invited to fill in the assessment questionnaire (D3.2. first version) made available online. The answers will be analysed and a score attributed to each one as described in step 2. In this way, it will be possible to understand how each business performs with respect of the relevant dimensions determining digital maturity and readiness, and, by calculating the indices, define how many of the selected businesses are already innovative, how many are laggards, if they are already developed form the digital point of view, and how fast they are in acquiring innovation. Furthermore, the dimension indices described above will indicate what are

the weak and strong points, and so what can also be expected to be a barrier or a booster with respect to the activities foreseen in WP4 and 5. For example, it will allow to discover that business A is not so ready at acquiring innovation (readiness super- index) and that this is due mainly to a) a poor internal knowledge not only of neuromarketing but more in general of digital marketing, as this activity is mostly outsourced to a web agency, and b) to a bad cross-functional communication as the senior management thinks informal communication is a loss of working time and discourage it. This will give a clear picture of the situation of the business and will also provide some better understanding of what the general obstacles toward digitalisation or innovation within tourism SMEs are. Usually reports on this topic just register a digital gap, a lack of innovation, but the only reason given for these gaps is the size, which however does not explain everything, especially considering that in other areas of the services sector there are very innovative micro-business (consultancy, digital service providers, etc.). Furthermore, the questionnaire results will inform the Euro-Emotur partnership of the kind of barriers to overcome once we start introducing neuromarketing tools and analysis, and therefore what work might be needed to make sure these barriers are lowered if not overcome. i.e., if cross functional communication does not work it might be a good idea to encourage senior management to invite different area managers to the meetings or training session to make sure everyone is aware of the tools, the advice given, etc.

The 100 selected SMEs will also be invited to provide feedback on the questionnaire itself: is it easy enough to fill in, are there unclear or ambiguous questions, etc.

Step 5. The participant observation sessions

Once the questionnaires have been filled in the participant observation protocol will be detailed and participant observation will start at 30 of the selected SMEs (10 per each cluster region). The answers to the questionnaire will help prioritise which aspects and behaviour to observe live, as it will be impossible to explore all the dimensions the assessment questionnaire considers. Priorities will be assigned because of ambiguous or conflicting answers, or aspects emerging as particularly interesting or innovative, or to verify the leadership style, the internal communication mechanisms, etc.

Step 6. The assessment questionnaire is reviewed and revised.

The participant observation not only will give a better understanding of the "observed" business but will also allow, by comparison and similarity, to understand the environment, context and behaviour of the other business selected. Most of all, it will allow the Euro-Emotur partnership to understand if there is a need to revise the assessment questionnaire itself or the scoring and indices calculation: do business tend to answer in a politically correct way to a question and in reality, they behave differently, so we need to re-

formulate the question? Are two dimensions particularly interrelated? Are there some people or other businesses (consultants, suppliers, etc.) holding a particularly relevant role we have not taken into account?

Furthermore, the feedback provided by the businesses representatives who will fill in the online questionnaire (Step 4) will be taken as well into consideration to adjust and revise the questionnaire if needed.

Step 7. D 3.4. Report on the digital tools used by SMEs, digital content produced, and their online performances.

The online questionnaire and the participant observations results will collect important data and information to complete the desk analysis on the selected SMEs digital activity, website performance etc. that will be conducted also within WP3 and partially shared with WP2 as some elements will partially be considered as selection criteria.

Step 8. D3.5. Report on the SMEs pool situation in terms of maturity and readiness to adopt innovation, including indications on the training needs.

Based on the answers to the questionnaires and the analysis of the results of the participant observation sessions the Euro-Emotur partnership will be able to cluster the 100 SMEs according to the maturity/readiness assessment as innovators, laggards, etc. (see par. 3.1.1) providing an immediate picture of the situation and of what could be a distribution within a typical tourism SMEs sample.

Figure 4. Application of the methodology to assess tourism SMEs maturity and readiness, Mains steps and outputs.
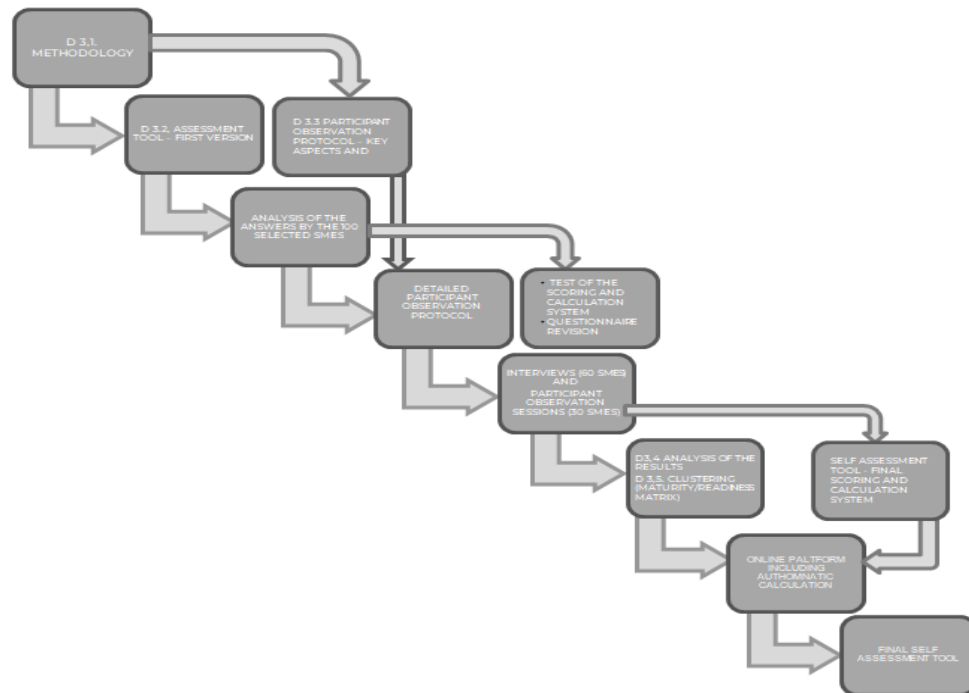
This will also be the basis to write a detailed report describing the selected businesses situation, their strengths, and weaknesses with regard to digital activities, their attitude towards innovation and their ability to implement it. This will all be essential to detail and carry on WP4 and WP5 activities.

Step 9. D3.2 The self-assessment tool final version

Once the questionnaire and the scoring system is revised, if needed, as described in step 6, and the dimensions indices and clustering system (D3.5) are tested through their application to the 100 selected SMEs (and adjusted if needed) it will be possible to deliver the final version of the self-assessment tool (D3.2). The online questionnaire will be made available through a platform complemented with an automatic system calculating the dimensions indices (Leadership and strategy, Critical Knowledge, Digital enablers, External communication, etc.) and positioning accordingly each respondent as innovator, laggard, etc. along the maturity/readiness axes. As described in the application form, this will constitute the final self-assessment tool (D3.2).

Thanks to this questionnaire available online and its automatic calculation system, each tourism business in the EU will be able to answer the questionnaire and not only see how they perform in respect to digital maturity and readiness to innovate with particular attention to neuromarketing tools, but also what are the aspects they should work more if they want to improve their results. The automatic system will provide an

answer similar to this:

3.2. Intermediate and final outputs

As described in the previous paragraph, WP3 outputs will have intermediate and final versions, and in particular:

D.3.2 first version - assessment tool - will include the online questionnaire, the answers scoring system as described above (step 1 and 2), and therefore a first idea on how all the dimension indices will be calculated. This will be test with the 100 SMEs participating in the Euro-Emotur project.

D3.2 final - The self-assessment tool

The self-assessment tool will include the revised and tested questionnaire and the final calculation system all available on a platform any European tourism business can access to answer the questionnaire and have and immediate feedback on their performance, and of their weak points.

D3.3 Basic version - Key aspects of the participant observation protocol

As described above, the first "release" of the participant observation protocol will focus on the key aspects of it, providing the general indications, unremovable aspects, timing, approach regarding the essential features of an observation protocol:

- Planning fo the sessions
- Aspects to be observed
- Target behaviours
- Observation grid

D3.3 Detailed version (s) - Observation protocols

Once the selection of the SMEs that will be involved in the Euro-Emotur project is completed and the SMEs have filled in the online questionnaire, the basic version of the protocol will be detailed and finalised and specific protocols for each kind of business (travel agencies, hotels, campings, etc.) will be delivered, taking into consideration also the business dimension (micro, medium or small enterprise) and prioritising the aspects and behaviour to be observed by the researchers according to the answers given to the questionnaire. Some details of the protocol, like for example the specific schedule of the sessions, will be then adapted to each specific SME.

APPENDIX
IN-DEPTH LITERATURE ANALYSIS AND METHODOLOGY FOR THE DESIGN OF THE SMES ASSESSMENT SYSTEM

1.SMEs digital maturity and readiness: literature review and practical experiences

Considering a) the general difficulty in transferring innovation, and the specific difficulties tourism SMEs face in implementing digitization and innovation, and b) the kind of innovation the Euro-Emotur project aims at introducing, the activities carried out in Work Package 3 want to make a step forward in the growth process of EU tourism SMEs, firstly by developing and implementing an integrated diagnostics to investigate the maturity/proficiency of the selected tourism-related SMEs in the use of communication and distribution technologies/tools and their readiness to uptake an innovation such as the use of neuro-marketing techniques and tools. Secondly, starting from the results obtained, by setting up a user-friendly assessment tool that tourism SMEs can use independently, without any external help, and retrieve valuable information about their current situation and potential for development, with some advice on how to act.

To develop the set of diagnostic tools and then the auto test/self-assessment tool, a thorough review of academic and professional literature was carried out, the aim being to investigate and capitalise on:

- the approaches that are already available to assess the level of digital readiness and maturity of the SMEs, specifically in relation to technologies and tools addressed to content management, website design and web marketing;
- self-assessment tools to assist SMEs in their digital innovation process;
- existing models to assess potential difficulties in transfer of knowledge (for example, Szulensky, 1996 and following literature) and, in particular, on "absorptive capacity" (see Cohen & Levinthal, 1990 and following literature), i.e. "the ability of an organisation to recognize the value of new, external information, assimilate it, and apply it to commercial ends" (Cohen & Levinthal, 1990, 128);
- previous experiences and tools used to analyse the transfer of knowledge and the readiness to introduce an innovation.

The focus was specifically on approaches and tools already adopted in other EU projects or in other cases involving SMEs, or in studies analysing cases or having an operational purpose.

1.1. Digital maturity assessment

Literature review and analysis of past experience showed first of all that there are several tools available for assessing digital maturity (by embedding in some cases also digital readiness) that are described in academic and professional literature, as well as in EU projects. However, most of them generally refer to all SMEs or are thought for manufacturing businesses. We can mention, for example those models analysed by Rauch et al. (2020) or listed in the Interreg Alpine Space SMART SPACE Project (Gay, 2018) or developed by the German National Academy of Science and Engineering (Acatech model, Schuh et al., 2017); or by Schumacher et al. (2016); Carolis et al. (2017); Blatz et al. (2018); Trotta & Garengo (2019); Pirola et al. (2019); Shallmo et al. (2020); Amaral & Peças (2021).

Going into detail about some of them, the SMART-SPACE project develops a coaching methodology to assist SMEs in their digital innovation process and, in doing so, makes a comparison of different maturity assessment systems available at EU level. The DREAMY- Digital Readiness Assessment Maturity model, presented by Carolis et al (2017), starts from the identification of the relevant processes that are strategic for digital transformation, but the component of readiness seems to be embedded in that of maturity.

Very few experiences/tools that have been specifically designed for businesses in the service/tourism sector, which have distinctive characteristics from those of other sectors, especially from manufacturing.

What is interesting to notice is that all these tools are currently used to assess tourism SMEs and, in the case of the first two mentioned, they are available on the website of the organisations that have led their development.

The European project TUR.I.S.I.CO, financed by the Interreg IT-FR Maritime 2014-2020, aims at enhancing the tourism industry competitiveness, by supporting the digitization process. Among the activities, the project has developed a self-assessment tool to help SMEs evaluate their level of digital maturity of tourism businesses. Each SME can access the tool on the project website, fill in the various questions and receive, as a result, a diagnosis of its current situation and some first advice on how to proceed. Another tool is that implemented by UNWTO in the field of the Digital Futures Program For Small And Medium-Sized Enterprise (SMEs). Scope of the Program is to support their digital transformation journey by facilitate the diffusion of specific technologies through appropriate training.

The Program includes the Small Business Digital Readiness Diagnostic, which was designed especially for SMEs serving the tourism sector. It allows businesses to measure how digitally ready they are, across six key strategic dimensions, to tailor a digital path and choose specific upskills training to equip their workforce, and to benchmark their performance against industry best practices. Other examples are those developed in Spain by the Navarra Government (Dirección General de Turismo, Comercio y Consumo del Gobierno de Navarra, 2022), which implemented a self-assessment system for the digital maturity of tourism businesses, and by the Tuscany Region – Italy (PRODEST project) which developed a tool for assessing tourism businesses maturity in terms of 4.0 technologies (Fantoni et al., 2021). Regarding in particular this case, the assessment was carried out through a questionnaire, which was specifically developed for tourism businesses, but which is based on the Acatech Model of the German National Academy of Science and Engineering aimed at assessing the Industry 4.0 Maturity Index in manufacturing firms (Schuh et al., 2017).

The following table summarises the main digital maturity models considered in the literature analysis and the relative dimensions of digital maturity on which these frameworks are based. For every model, the table specifies if it addresses to general businesses, to SMEs and specifically to tourism firms.

Table 2 – Overview of the main digital maturity models available in the

literature

Source	Addressed to SMEs	Main digital maturity dimensions
Models addressed to businesses in general and or manufacturing. companies		
Schumacher et al. (2016)	NO (Manufacturing businesses in general)	1. Strategy 2. Leadership 3. Customers 4. Products 5. Operations 6. Culture 7. People 8. Governance 9. Technology
DREAMY project (Carolis et al., 2017)	NO (Manufacturing businesses in general)	1. Process 2. Monitoring and control 3. Technology 4. Organisation
Schuh et al. (2017)	NO (Manufacturing businesses in general)	1. Resources 2. Information systems 3. Organisational structure 4. Culture
Blatz et al. (2018)	YES (SMEs in general)	1. Strategy and leadership 2. Company culture and organisation 3. IT infrastructure 4. Data maturity 5. Process and Operations 6. Product (use face)
German Digital Model In Gay (2018)	YES (SMEs in general)	1. Strategy 2. Leadership 3. Products 4. Operations 5. Culture 6. People 7. Governance 8. Technology

Source	Addressed to SMEs	Main digital maturity dimensions
IMP³rove Digital Innovation Quotient in Gay (2018)	YES (innovative SMEs)	1. Strategy 2. Business model 3. Processes 4. Ecosystem and Culture 5. Enablers for Digital Innovation
Test Industria 4.0 In Gay (2018)	YES (manufacturing SMEs)	1. Design and engineering 2. Handling 3. Human resources 4. Production 5. Supply chain 6. Quality 7. Logistic 8. Marketing, customer service
Self-Check Industries 4.0 In Gay (2018)	YES (manufacturing SMEs)	1. Smart product 2. Smart Manufacturing 3. Smart Organisation 4. Smart Technology
Maturity Model, making advanced manufacturing measurable In Gay (2018)	YES (SMEs in general)	1. Strategy 2. Processes and operations 3. Enablers for digital innovation
Pirola et al. (2019)	YES (Model tested on manufacturing businesses)	1. Strategy 2. People 3. Processes 4. Technology integration
Trotta & Garengo (2019)	YES (manufacturing SMEs)	1. Strategy 2. Technology 3. Production (processes) 4. Products 5. People
Models analysed in Rauch et al. (2020)	YES	1. Operations 2. Organisation 3. Sociocultural 4. Technology

Source	Addressed to SMEs	Main digital maturity dimensions
Shallmo et al. (2020)	YES (SMEs in general)	1. Strategy 2. Partner interface 3. Processes 4. Employees 5. Technologies 6. Customer interface 7. Products and services
Amaral & Peças (2021)	YES (manufacturing SMEs)	1. Technology 2. Production processes 3. People 4. Product 5. Organisation 6. Change (strategy)
Models addressed to tourism businesses		
Tuscany Region - PRODEST project (Fantoni et al., 2021)	NO	1. Organisation 2. Customer relationship 3. Culture 4. Front office digital technologies 5. Back office digital technologies 6. Supply chain 7. Skills 8. Projects
Navarra Tourism Direction (2022)	not specified	1. Business model 2. Digital culture 3. Customer relationship 4. Innovation 5. Smart processes 6. Digital business 7. Sustainability 8. Technology
UNWTO Digital Futures	YES	1. Big Data & Analytics 2. Business growth 3. Connectivity 4. E-commerce 5. Payments and security
TUR.I.S.I.CO (Interreg IT-FR Maritime) – in progress	YES	1. Strategic vision 2. Management of digital products 3. Digital technology use

As shown in the previous table, the comparison of the several approaches and tools identified – addressed to businesses in general or developed for tourism enterprises – highlights that most of them include the same dimensions for representing and measuring the digital maturity. Some systems propose a broader set of dimensions, while other ones define a more restricted set of key variables, which in turn are articulated in sub-variables by including the same aspects considered in the other models as well.

Summarising, the main digital maturity dimensions assessed by the approaches/tools analysed are as follows:

- ICT, in terms of digital infrastructure and its use by the company;
- Strategy, leadership and organisation;
- Culture and digital/data awareness;
- Skills and human resources;
- Processes (referred to production);
- Products and customer relationships.

Regarding the last two dimensions – processes and products -, in the specific case of tourism, they should be considered as a unique aspect. Indeed, since the peculiarity of tourism production, which has to do with services and not goods (as instead in manufacturing), the production phase (processes) coincides with that of delivery and customer relationships.

1.2. "Stickiness" and "absorptive capacity" assessment

In addition to digital maturity, another aspect to take into consideration is the readiness of a tourism business to uptake an innovation, i.e., the rapidity to react to stimuli coming from the external environment (market and value chain) and implement a reaction to this stimulus - with specific reference, in the case of the Euro-Emotur project, to the use of neuro-marketing techniques. This dimension is generally embedded in the assessment of SME digital maturity, which, according to CapGemini (2017), is a combination of digital intensity (maturity in strict terms) and transformation management intensity (readiness). However, from the literature analysis emerged the possibility to integrate in the assessment model a series of specific questions aimed at evaluating "stickiness" to be expected in the transfer of innovation (Szulanski, 1996, 2000). Understanding the potential difficulties in transferring an innovation to a SME and the reasons behind them is important to the specific case of the Euro-Emotur project, considering:

- the peculiarity and newness of the kind of knowledge, as consumer neurosciences and neuromarketing are a cutting edge subject, which tend to defy what people think they know about customers and their decision making process, and do not concern only digital aspects: there might be barriers in transferring this kind of knowledge independent from the ones linked to the adoption of digital innovation;

- the introduction and implementation of neuromarketing techniques will be most probably approached as a project by the SMEs involved, and the people specifically involved in projects play an important role in enabling knowledge transfer and assimilation (Oti-Sarpong & Leiringer, 2021), but none of the models assessing digital maturity takes this aspect into consideration;
- digital maturity assessment tools mainly investigate the business exploitative innovation strategy (presently employed technologies and related tasks), but less their explorative one (search for new information and technologies) (Jansen et al., 2006);
- digital maturity assessment approaches are mainly focused on the expertise and technology already acquired by the organisation, and on the role ICT play within the business' strategy, but not on how they lived the "process" of receiving and implementing innovation and the difficulties they faced.

Therefore, the integration of two different dimensions - the static one represented by the assessment of digital maturity, and the dynamic one, focused on the evaluation of the level of stickiness affecting the transfer of knowledge in itself – makes the tool developed by the Euro-Emotur project a real innovation in the context of existing approaches. It provides the innovation conferrer and the recipient itself with a clearer idea of how ready is the recipient and which difficulties might be expected during the innovation transfer and implementation.

To assess "stickiness" or "internal stickiness" a variety of dimensions and subdimensions can be considered. These dimensions are related to the characteristics of the source, the nature of the knowledge to be transferred, and the features of the recipient. Three, however are the most important ones (Szulanski, 1996, Argote et al., 2003):

- (Lack of) absorptive capacity (characteristic of the recipient);
- causal ambiguity (characteristic of the knowledge);
- arduous relationship (characteristic of the source)

The assessment of stickiness and the impact of its three main dimensions on the transfer of knowledge have been largely investigated and applied to different businesses (Argote, 2012; Li & Hsieh, 2009). Among Euro-Emotur partners, CISET, with Manchester Metropolitan University, adapted the stickiness assessment system to assess the difficulty in the innovation transfer between Higher Education institutions, (Moulding & Montaguti, 2011, 2015), and, on its own, in the transfer of knowledge between Senior and Junior employees of SMEs of the tourist sector (Anoè et al., 2015). It is also possible to draw on some, although sparse, work done to apply it to innovation transfer in tourism organisations (Shaw & Williams, 2009).

In the specific case of of Euro-Emotur project, the focus of the stickiness assessment needs to be the recipients' characteristics, for two reasons:

- it needs to be consistent with the maturity assessment models;
- the final aim is to develop a self-assessment tool (and a recipient can scarcely assess the features of a knowledge they know almost nothing about).

Therefore, the dimension to be investigated is the "absorptive capacity" (Szulanski, 1996; Cohen & Levinithal, 1990, and following   literature) – or lack thereof - of the SMEs.

Absorptive capacity is the ability of an organisation to "recognize the value of new, external information, assimilate it, and apply it to commercial ends" (Cohen and Cohen and Levinthal, 1990: 128), and it is a concept vastly explored in management studies (Song et al., 2018), including its role in the ability of firms to re-design their business models in response to the emergence of Industry 4.0. (Mueller et al., 2021). Absorptive capacity is considered a two-dimension concept: acquisition and assimilation represent potential absorptive capacity, while transformation and exploitation represent realised absorptive capacity (Zahra & George, 2002). Given this definition, absorptive capacity can effectively integrate the "maturity" concept to:

- better define a "readiness" concept, i.e. the exploratory attitude of the business towards innovation and its ability to react to stimuli;
- understand the dynamic and process-related dimensions of acquiring and exploiting a completely new knowledge, such as neuromarketing is going to be for the majority of the SMEs that will be involved in the Euro-Emotur project.

Furthermore, assessing absorptive capacity will provide the project partnership with more information and alert them about the potential barriers to the knowledge transfer within each SME. For these reasons, the concept of absorptive capacity can be effectively employed to assess "readiness" within the assessment model we propose in this document, differentiating it from maturity (see also Schmidt & Rammer, 2006; Sancho-Zamora et al. 2021)

According to the results of various studies and on innovative/not innovative businesses or business units conducted over the years, the absorptive capacity of an organisation depends mainly on a series of   factors linked to:
- the recipient's previous critical knowledge and experience;
- the acquired ability to import knowledge and distribute it inside the firm: external communication structures, balance between internal distribution of the expertise and a good internal communication (Cohen, & Levinthal, 1990).

More in detail, to assess absorptive capacity it is necessary to investigate 4 different dimensions, as explained below.

1.Critical knowledge: absorptive capacity develops cumulatively (Cohen & Levinthal, 1990: 131), which means that it is partially a function of the knowledge and skills the recipient already possesses (Dierrickx & Cool, 1989). Critical knowledge does not limit to the technical expertise but encompass also the awareness of where useful complementary expertise can be found within and outside the 34 organizations (Cohen, & Levinthal, 1990). Its role with respect to the ability of a business to acquire knowledge and innovate is such that the loss of personnel – or better of personnel skills – reduces a department/unit/business ability to acquire, analyse, and use new knowledge (Lin et al., 2016). Within a transfer of knowledge, the most critical knowledge and skills to be considered are, of course, the ones related to the knowledge or the practice to be transferred;

2.External communication structure: as no business develops all the resources internally, the connection with the external environment is essential to the ability to recognise and apply new knowledge. More in detail, different studies demonstrated that a wide and differentiated range of knowledge sources and partners favours innovation (Ferreras Mendez et al., 2015). In the search for, or exposure to, new knowledge, the search breadth - so through many different sources - more than the depth impacts successful innovation by SMEs (Aliasghar et al., 2020). The role of external communication is so important that position of a business unit in an organisational network (isolated, peripheral or in a hub position) can be considered a source of innovation in itself (Tsai, 2001);

3.Gatekeepers' role and skills: in a transfer process a fundamental role is played by the so called "gatekeepers", the people who capture external sources of information and help "transcoding" it, acting as a link between the source and the rest of their own 34rganization, or even a cluster of businesses. In the end, the absorptive capacity of a business depends heavily on their ability to acquire and introduce innovation (Huang et al., 2018). Despite the development of IT platforms and learning platforms, gatekeepers still play an essential role also in introducing new IT and using IT in an innovative way (Huang et al., 2018). This seems confirmed by the recently spreading concept of microfoundations (Helfat & Peteraf, 2015), which argues that the ability of a business to change and develop depends basically on the characteristics of some specific managers;

4.Cross functional communication: the absorptive capacity of an organisation is also a function of the ease of internal communication between functions (Cohen & Levinthal, 1990; Yang & Tsai, 2019), as this will affect the speed and effectiveness of the transmission between the gatekeepers and the whole organisation. There is discussion on the ideal balance between specialisation and integration of expertise and knowledge across functions and teams, but surely a degree of integration is needed to be innovative (Lee & Kapoor, 2017). The most fruitful recipient's asset for a transfer of innovation appears to be linked to a balance between shared and different knowledge within the single business unit: the overlap allows an effective

communication, while diversity in the work environment stimulates new ideas and the learning ability (Simon, 1985; West, 2002), and enhance the internal capacity to effectively apply external knowledge into new products or processes.
Another aspect of internal communication affecting absorptive capacity is linked to the characteristics of the communication itself such as frequency, quality (comprehensive, detailed, credible, well-presented, and relevant information), and informality (personalised, spontaneous, and unstructured communication such as unplanned face-to-face discussion, and meeting or personal conversation during breaks work better than formal communication) (Tiwana and Mclean, 2005).

As highlighted by the previous points, the advantage of an approach that assesses absorptive capacity is that it allows not only to evaluate the previous proficiency and openness towards innovation (as the usual digital maturity assessments do) but also the external communication structure, the differentiation of expertise (Cohen & Levinithal, 1990) and, most important for the tourism SMEs and the focus of this project, the skills and role of the gatekeepers.

Regarding in particular the absorptive capacity of the SMEs, in the specific case of the Euro-Emotur project, it might be important to assess the level and scope of the relationships with their clients and suppliers, among which particularly relevant will be the relationship with:

   a) the technology providers and the web agencies;

   b) the relationship with the final customers

In the specific case of implementing the changes suggested by the neuromarketing analysis (WP 4), in fact, weak or poorly managed relationships with the technology providers can generate barriers to the actual implementation.

A second key factor for the success of the implementation of Euro-Emotur project within each business will be the skills and knowledge of the gatekeepers, who will be the ones in charge not only to receive knowledge about neuromarketing and its potential in improving digital marketing, but also to maintain the relationship with the technology providers and other people involved in the process within the business. One of the possible issues in this respect is that within some of the tourism SMEs selected for the Euro-Emotur project - for hierarchical or family related reasons - the role of gatekeeper or innovation supervisor is played by someone who does not possess the expertise and is not an innovation seeker.

A third important factor is the differentiation of expertise within the businesses: in organisations such as tourism SMEs, it is possible to have either

human resources with a wide variety of functions and skills, or people with very focused roles. It is also possible that within the SMEs all the employees are experts in different aspects of operations and "analogical" features of the business, while web marketing and all digital aspects are completely outsourced. In such a case, there might be no one internally able to implement the innovation the Euro-Emotur project intends to introduce to the business, and the partnership will need to create a stronger direct relationship with the external enabler - who really holds the knowledge - while advising and supporting the business itself to train its own employees.

All these factors can enrich the assessment on digital maturity and readiness, and some of them will be particularly important as they will provide an insight on individuals, not only on the organisation as a whole: it is known that some of the major factors hampering innovation, especially in the service sector, are created by the individuals who are supposed to "use" the innovation (Payne & Frow, 2006; Foss et al., 2008). Furthermore, the absorbitive capacity evaluation will help the Euro-emotur partnership to identify in advance what might be the possible barriers to the transfer of knowledge and innovation, and it has been demonstrated that, even within the boundaries of the same firm, project managers need to be aware of barriers, as they can completely hamper the success of a transfer or implementation of innovation (De Araujo et al. , 2021).

2.Development of the specific tourism SMEs diagnostic process: methodology and main outputs

2.1. Definition of Euro-Emotur SMEs clusters, dimensions and indicators for digital maturity and readiness

Starting from the analysis carried out in the previous section, the diagnostic process put into place within the Euro-Emotur project and herewith presented, starts by defining the two main dimensions, sub-dimensions, and indicators to assess:

1. the maturity of the selected tourism SMEs in the adoption and implementation of communication/distribution technologies (general vision and strategy; level of "sedimentation", from simple to complex tools; intensity of use and monitoring, etc.);
2. their readiness (absorptive capacity) to uptake an innovation, i.e. the rapidity to react to digital (and other kinds of) stimuli coming from the external environment (network of relationships; external & internal communication, etc.), the results obtained from previous projects (knowledge & expertise, with specific attention to neuromarketing),

A first set of indices to assess each dimension and sub-dimension is presented in this document and, on this basis, an online questionnaire used to develop the first step of the investigation will be designed. The questionnaire is the embryonal structure of the self- assessment tool (D3.2). On the same basis also the structure of the protocol for participant observation (D3.3) will be developed.
The SMEs selected to take part in the Euro-Emotur project will be asked to answer the questionnaire to assess their maturity and readiness. Based on their answer, specific indices for the two main dimensions (maturity and readiness) will allow to measure the performance of each of the selected businesses with respect to these two aspects. The final aim of the indices is to classify tourism SMEs in several clusters according to their level of maturity and readiness. Therefore, before going into the details of the dimensions and indicators, it is essential to introduce the methodology that will be implemented for clustering SMEs.

2.1.1. The clusters for classifying tourism-related SMEs according to their maturity and readiness.

The model for clustering SMEs according to their level of digital maturity and readiness is based on the Diffusion of Innovation (DOI) Theory, developed by

E.M. Rogers in 1962, which was considered particularly useful also in the case of this project for identifying different categories of businesses depending on

their level of digital adoption and reactivity. The DOI theory originated in communication to explain how, over time, an idea or product gains momentum and spreads among a specific population or social system. It found that this diffusion depends on the fact that people, as people, as part of a social system, adopt a new idea, behaviour, or product, i.e. people start doing something differently than what they had done previously (i.e., purchase or use a new product, acquire and perform a new behaviour, etc.). However, this happens - and then diffusion is possible - only if people perceive the idea, behaviour, or product as new or innovative. The DOI theory also explains that the adoption of a new idea, behaviour, or product (i.e., "innovation") does not happen simultaneously for all people, but it is a process whereby some people are more apt to adopt the innovation than others. People who adopt an innovation early have different characteristics than people who adopt an innovation later and then the DOI theory distinguishes innovators and early adopters from early and late majority and laggards.

The DOI theory has been applied in many fields and sectors and it can be adapted also to this specific case for explaining the evolution of digital adoption and reactivity of SMEs. Starting from the categories described by the DOI theory, four main clusters of enterprises, which represent the main evolutionary steps, can be identified. In addition, other five "intermediate" clusters (grey squares) complete the set of categories, for a total of 9 possible combinations according to which the SMEs analysed can be classified. Clusters are summarised in the following Maturity/Readiness Matrix. The Matrix is based on a 5-point scale for assessing both the Digital Readiness (represented on the vertical ordinate axes) and the Digital Maturity (on the horizontal abscissa axes) indicators, where the 1-2,3 points indicate the lowest level (poor readiness/maturity); the 2,4-3,6 points indicate the medium level (moderate readiness/maturity); and the 3,7-5 points mean the highest level (high readiness/maturity). The 5-point scale was derived by some previous experiences in the literature, and it allows to distinguish businesses and place them in the most suitable and consistent cluster according to their level of maturity and readiness more effectively. Adopting a smaller measurement scale (for example 3-point scale) would risk leading to an excessive concentration of the businesses in the same cluster. By combining the level of digital readiness and digital maturity reached by the SMEs which will be assessed, it is possible to classify them in one of the nine clusters.

As shown in the matrix, the four main clusters are:

- Innovators, with a high level both of maturity and readiness;
- Early Adopters, with low maturity but high readiness (e.g., startups);
- Slow Adopters, with high maturity but low readiness;
- Laggards, with low level both of maturity and readiness

Figure 5 - The Maturity/Readiness Matrix
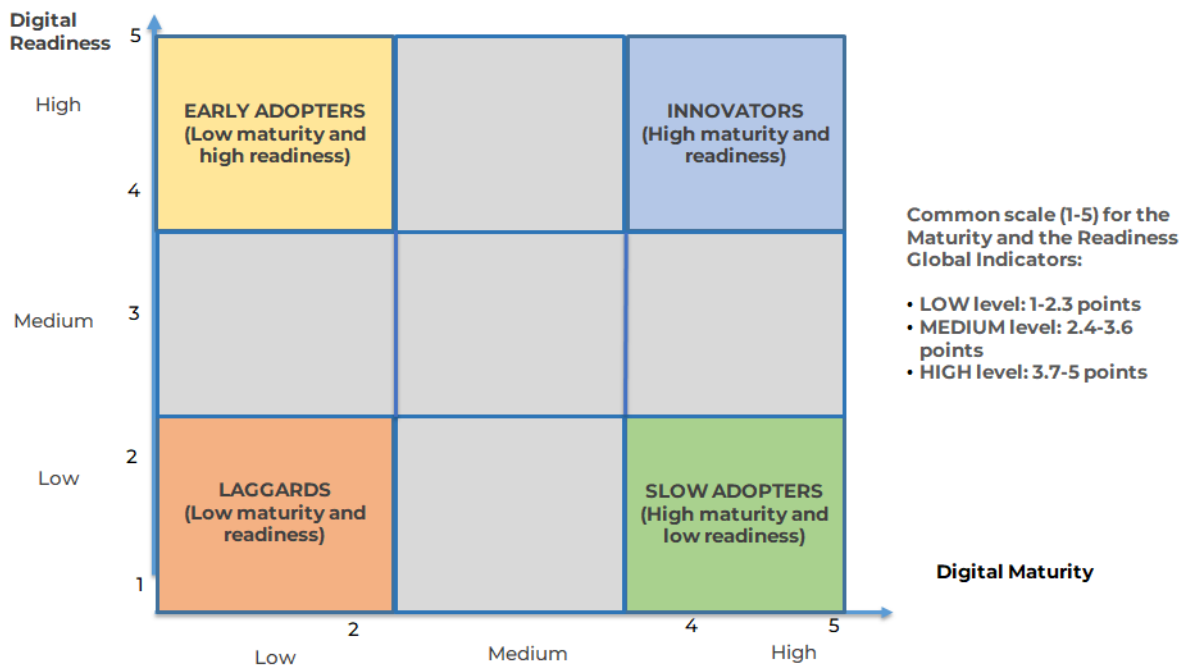
2.1.2.The set of dimensions and sub-dimensions for the assessment of SMEs digital maturity and readiness

As described in chapter 1 of this Appendix digital maturity and readiness depend on different factors, such as the employees' skills, the leadership style, the level of use of the data, etc. (which affect digital maturity), or external communication, critical knowledge, the gatekeeper's role, etc. (affecting readiness/absorptive capacity). On this basis, two sets of dimensions and sub-dimensions (indicators) impacting on digital maturity and readiness have been identified. These two sets are the result of a careful selection carried out considering the following criteria:

- representativeness, i.e., the ability of the dimensions to explain the main components of digital maturity and readiness; in this sense the selection was based on the variables that are most frequently used and cited in the above-mentioned studies and previous projects taken into consideration; adaptability, i.e., the ability of the dimensions to adapt to tourism SMEs, in order to consider the specific characteristics of these businesses; measurability, i.e., the possibility of expressing the dimensions in easily measurable indicators that can be translated into easy questions to be included in the questionnaire;
- number, in the sense that the set of dimensions and sub-dimensions should not be too long, in order to balance the representativeness with the need to build an agile assessment tool and an easy questionnaire from it; indeed, as underlined by the project TUR.I.S.ICO, it is not easy to involve SMEs in self-assessment and in filling in a questionnaire, in particular if it is too long and complex.

Based on what emerged in paragraphs 1.1 and 1.2 of this Appendix, six dimensions for the digital maturity and five dimensions for the digital readiness (intended in terms of absorptive capacity) were selected. As regards digital maturity, dimensions are as follows.

- **ICT infrastructure, resources and use** - It represents a key technical component and it refers to the availability and use by the business of infrastructures and tools that are: capable of storing, processing and protecting big volumes of data; capable of guaranteeing seamless interconnectivity (networking of devices, communications and exchange with IT systems of external partners, etc.); based on standardised interfaces enabling interoperability and faster integrations with new systems; characterised by a high-level of updating through the adoption and implementation of new technologies to follow the change.
- **Strategy and leadership** – It first of all refers to the general awareness and acknowledgement of the relevance of digitization and to the consequent willingness to invest and develop new business models, when needed. Secondly it refers specifically to the digital strategy of the business and how much it is connected with the general business strategy, communicated within the business, put into practice and measured in terms of performance.
- **Processes and products** – It first of all refers to the execution of activity and tasks within the business (processes) and to the level at which internal and external processes are integrated, measured in terms of efficiency and effectiveness, flexible to fluctuations (i.e., seasonal peak), and supported and optimised by IT, also through automation when economically and technologically reasonable. Secondly this dimension refers to product and customers: possibility to offer digital services together with the product in order to support customer experience and the relationships with them and at the same time collect useful data on product utilisation and clients' preferences; development of digital surveys asking the client for feedback, etc.
- **Data awareness** – It deals with the acknowledgement of the "value" of data, in terms of potential information that is possible to exploit from them for process and product improvement and innovation; it also deals with the awareness of what data are available, collectable and usable within the business and how they can be analysed, evaluated and assessed in order to exploit information.
- **Skills** – This dimension refers to the set of knowledge and competences that are necessary to effectively utilise ICT inside the business and to exploit valuable information from data collected through them. Human resources need to be led and trained, especially when new technologies are adopted, not only for using them but also for understanding why they should be used and the impact and advantages on their personal activity and on the company.
- **Digital enablers (external)** - It deals with external digital service

providers and partners with which the business interacts in order to implement new ICT solutions and receive support. The relations with the enablers can be more or less prepositive and oriented to change and innovation: on the one hand there are businesses that frequently interact with their digital service providers asking to develop new solutions; on the other hand, businesses that interact once in a while, asking for support and maintenance and not for a real change.

As regards digital readiness, this is intended as absorptive capacity and the dimensions selected for describing it are as follows.

- **Critical knowledge** (which will be isolated from the wider skills assessment included in the Maturity evaluation) – In the specific case of the Euro-Emotur project neuromarketing is a key knowledge the SMEs' selected to take part in the project should be familiar with. Therefore, their awareness about neuromarketing will be explored, together with their level of trust in neuromarketing approaches and their perception about the value for money it can deliver - as noted by Crespo-Pereira et al. (2020), different studies underline how neuromarketing adoption, even within major corporations, is slowed down because senior managers lack confidence in the discipline and its methods, doubt its reputation, and ethics, or are concerned about its costs. If the business is not only aware of what neuromarketing is, but apply neuromarketing tools or solutions, the assessment system will explore the level of internal knowledge developed, as another obstacle preventing businesses to use neuromarketing can be a lack of knowledge and training (Crespo-Pereira et al., 2020). However, information- let alone expertise - about neuromarketing and its tools is not expected to be particularly widespread mango tourism SMEs -as the subject is still quite a novelty - so the main focus of this dimension assessment will be on the business functions and tools Euro-Emotur means to apply neuromarketing to - websites, e-commerce and digital marketing more in general. Therefore, the assessment of the business-critical knowledge will refer to the set of previous digital marketing expertise gained through investments, the participation into projects, etc.

- **External communication & networking** – Since absorptive capacity is higher and the transfer of knowledge easier when a business has a dense and well-established external network of partner, the assessment system for the Euro-Emotur project will explore the whole network of relationships that the business and its employee have developed and consolidated over the years, especially with digital service providers, research centres and universities, and with other businesses outside the tourism supply chain.

- **Cross functional communication - Differentiation of expertise within the team** – For the specific purpose of this assessment, it was decided

to divide the two main components of the "Cross functional communication" dimension, - i.e., the differentiation of expertise and the characteristics of the communication itself. The diversity of knowledge – technical but also soft skills - available among the employees of a business plays an important role in supporting the learning process. As seen in the previous chapter, a diversified background provides a solid basis in the transfer of new knowledge, as it allows to create new associations between information and to better recognize its value and smooths internal communication. Therefore, the Euro-Emotur assessment tool will explore how differentiated is the background of the non-seasonal staff of the SMEs selected to take part into the project, if the non-seasonal personnel is distributed among different functions or concentrated. e.g., a high concentration of purely administrative staff risk to hamper the spreading of knowledge related to digital neuromarketing through the organisation, its implementation -as it will rely on few people - and also the retaining of knowledge.
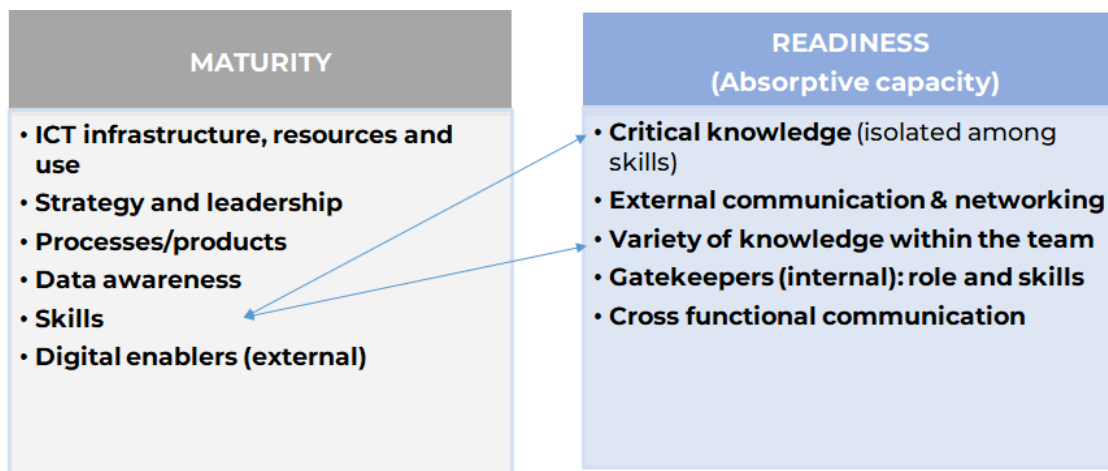
- **Cross functional communication – Characteristic of the communication** – For this aspect of cross functional communication, the assessment tool will explore the formal and informal opportunities available inside the business for supporting the communication and exchange of knowledge and information between the different departments (or single people in case of micro-entreprises), investigating policies aimed at rotating employees, involving cross functional teams in project development; or with the availability of digital tools for team and cross team communication.

- **Gatekeepers (internal) role and skills** – As seen, Internal gatekeepers refer to those figures who act as intermediaries and facilitators for the business in the assimilation of knowledge – in this case digital and neuromarketing related knowledge - from the external. They can be the employees in charge of the relationship with digital service providers and other partners, or responsible for digital marketing, website development, etc. It is important to assess the skills, role, and level of responsibility inside the organisation of these employees. If already identified, specific attention will be dedicated to the persons who will be in charge of the Euro-Emotur project itself within each of the selected SMEs. In the case of SMEs, the gatekeeper's dimension might be particularly tricky to understand, and so great attention must be used when investigating it. Many businesses owners might not have the awareness needed to identify employees in charge of relationships with digital service providers, Euro-Emotur, IT providers, etc. specifically as "gatekeepers". Therefore, the choice of "who" is in charge of these relationships -although critical - might depend on a hierarchical criterion (the risk in this case is that the gatekeeper might have no specific skills and no attitude to innovation), or on "enthusiasm" about digital solutions, IT, etc. (the risk in this case is that

the gatekeeper has no possibility to impact any decision and so no power over the implementation of the knowledge and tools acquired during the project.

The following figure summarises the dimensions identified for digital maturity and readiness (as absorptive capacity).

Figure 6 – Topics and main dimensions

MATURITY	READINESS (Absorptive capacity)
• ICT infrastructure, resources and use • Strategy and leadership • Processes/products • Data awareness • Skills • Digital enablers (external)	• Critical knowledge (isolated among skills) • External communication & networking • Variety of knowledge within the team • Gatekeepers (internal): role and skills • Cross functional communication

For each dimension both of the digital maturity and the readiness, a number of sub-dimensions have been identified and each sub-dimension associated with an index, as described in the following paragraph.

As anticipated, the indicators for each sub-dimension will be measured through a questionnaire submitted to the SMEs involved in the project. Each sub-dimension will be translated into one or more appropriate questions and assessed through a Likert scale (1-5), that will be adapted to the kind of questions. In this way it will be possible to create an index for each sub-dimension, and from these indices the dimension (process/products, Critical knowledge, etc.) will be calculated.

Furthermore, the results of the questionnaire filled in by each SME will be compared with the results of the desk analysis and of the other activities included in the diagnostic process, i.e., the in-depth interviews, and the participating observation, which are also tasks included in the WP3 activities. The main output of these activities will be a tested set of questions and indices that will constitute the basis to develop this model (the questionnaire and the indices calculation system) into a self-assessment tool that will be made available to every European tourism SME willing to test its maturity/readiness with respect to digital innovation and neuromarketing.

2.1.3. The first tentative set of indicators

In addition to the selection of dimensions and sub-dimensions, this document introducing the methodology already presents a proposal on how to calculate a synthetic index for each dimension and finally for the main two topics - digital maturity and digital readiness. Starting from answers obtained in the questions referred to each sub-dimensions (indicators) and measured through the 5-point Likert scale, the index for each dimension will be calculated as a simple mean of the indicators that make it up. Finally, the indexes expressing the overall maturity and the readiness will be calculated as a weighted mean of the indexes of the related dimensions. The present methodology, as developed, allows, in addition to the level of maturity and readiness, the cross analysis of the value of each dimension/sub-dimension for the two different topics. In such a way it can help to identify the presence and the intensity of the correlation between maturity and readiness (maturity/readiness matrix). The following two tables summarise the specific sub-dimensions (indicators) and dimensions for digital maturity (Table 2) and readiness - absorptive capacity (Table 3).

Table 3 – Digital maturity sub-dimensions / indicators

Indicator	Dimension	Topic
1. Web connectivity	ICT Infrastructure, Resource and Use Index (simple mean of 11 indicators)	MATURITY INDEX (WEIGHTED MEAN OF 6 DIMENSION INDEXES)
2. Presence of a website (if mobile friendly or not)		
3. Monitoring of web positioning and reputation		
4. Presence on social media		
5. Use of advertising tools (Google Adwords)		
6. N° of people in charge of IT infrastructure and tools (staff or external consultants)		
7. Presence of software for data analytics		
8. Presence of SW per for business activity management		
9. Presence of an e-commerce system		

Indicator	Dimension	Topic
10. Presence of a channel manager		
11. Other tools and applications (e.g., Neuromarketing tools…)		
12. Existence and implementation of a digital strategy	Strategy & Leadership Index (simple mean of 5 indicators)	
13. Existence of KPI to check the results achieved		
14. Leadership style (e.g., involvement of staff in decisions made)		
15. Who is empowered to take decisions concerning SME digitalization		
16. Existence and type of collaboration in the SME value chain		
17. Systematicity and automation of data collection on consumers' behaviour (implementation of procedures, digital surveys, support software, etc.)	Process & Product Index (Simple mean of 5 indicators)	
18. Use of consumers' data to propose new or personalised product (e.g. no use - use of feedback -– surveys, neuromarketing tools…)		
19. Automation/digital support of FO operations (e-mails answer, check in/out, information request, etc.)		
20. Automation of data sharing between systems (CRMS, PMS, etc.) and departments		
21. Level of interaction allowed between customers and domotics systems, IoT, websites, etc.		

Indicator	Dimension	Topic
22. Availability of data sets on consumer profile and behaviour	Data Awareness Index (simple mean of 3 indicators)	
23. Use of data analytics tools		
24.Staff skills		
25. N° of graduated non seasonal employees / Total n° of non-seasonal workers	Skills Index (simple mean of 3 indicators)	
26. N° of courses, coaching programmes, training meetings, etc. organized by the firm on new software, digital tools, automatizing systems, etc. in a 5-year period		
27. N° of employees who attended the above-mentioned courses / Total n° of employees (seasonal employees included)		
28.Frequency of contacts between the owner/CEO or managers with the main digital service provider per month	Digital Enablers Index (Simple mean of 3 indicators)	
29. Frequency of contacts between the employees in charge of digital marketing, website, etc. and the digital provider staff		
30.Level of relationship with the digital provider: firm asking often to implement new solutions – enabler proposing often new solutions; firm asking for new solutions once in a while, etc. – just maintenance		

Table 4 – Readiness indicators

Indicator	Dimension	Topic
1. N° of people involved in this project who took part in previous projects related to digital marketing / Total n° of employees	**Critical Knowledge Index (Simple mean of 3 indicators)**	**READINESS (ABSORPTIVE CAPACITY) INDEX (MEAN OF THE 5 DIMENSION INDEXES)**
2. N° of projects (self-funded or sponsored) related to digital marketing the business took part in/implemented in a 5 year period		
3. N° of times the website/s have been changed (excluding content update) in the last 10 years		
4. Awareness and interest in neuromarketing - n. of times the SME crossed neuromarketing related tools or approaches in the last 5 years and level of interaction (learned about in a course, implemented some aspects to improve their website, had their website tested with neuromarketing tools, etc.)		
5. (If there is awareness) Level of Internal knowledge about neuromarketing tools (have they developed an internal knowledge or are they just trusting their consultants with this)?		
6. Level of trust/scepticism towards neuromarketing tools/approach (are doubting the basic concepts?		

Indicator	Dimension	Topic
7. N° of agreements with other businesses different from value chain related contract (suppliers/clients)	External Communication & Networking Index (simple mean of 4 indicators)	
8. N° agreements with universities/research centres		
9. Differentiation of the agreement (kind of agreement, partners' business sectors, partners' territorial level)		
10. Kind of relationship: n° of agreements where the recipient just requires inputs (employees, interns, technical support, etc.) /Total n° agreements		
11. Recruitment criteria: presence and weight of non-technical skills / Total n° of non-seasonal workers	Differentiation of Expertise Index (simple mean of 4 indicators)	
12. N° of people employed within the main department / Total n° of non-seasonal workers		
13 N° of people employed for mainly technical activities (front office, administration, wait staff, etc) / Total no. of non-seasonal workers		

Indicator	Dimension	Topic
14. Level of non-seasonal personnel CVs 'differentiation (education, work experience)	Differentiation of Expertise Index (simple mean of 4 indicators)	
15. Employees in charge of the relationship with digital service providers, OTAs, etcetc.: role within the organization (manager, executive within a marketing/digital marketing department, executive specifically in charge of digital marketing but attached to another team - e.g. front office-, manager with other main tasks - executive with other main tasks) – or level of access to the owner/CEO	Gatekeepers (role and skills) Index (simple mean of 3 indicators)	
16. Employees in charge of website update, social media: role within the organization		
17. Employees in charge of digital marketing: level of specific training (education or training paid by the firm): specific education degree – specific courses certificate – attendance to public sponsored courses – etc.)		
18. Presence of policies aimed at rotating employees among different departments and frequency of the rotation	Cross-functional Communication Index (Simple mean of 5 indicators)	
19. Presence of digital tools to support team and cross team communication and intensity of use		
20. n° of incentives or multidisciplinary courses organised by the firm in th last 7 years		
21. Informality of communication - willingness to tolerate/encourage informal meetings and direct communication tools		

22. n° of project employing cross functional teams realised in a 5-year period		

2.2. First indications on the online questionnaire and the testing phase

In addition to the system for clustering tourism-related SMEs according to their digital maturity and readiness (see 3.1.1), the set of dimensions and sub-dimensions for assessing these two topics and the proposal for calculating the relative indices, the methodology include the tools for collecting data and information for the assessment. These tools are, in particular:

- the online assessment questionnaire to be distributed through an online survey and filled in by the selected tourism-related SMEs;
- the guideline for in depth interviews and participant observation.

As mentioned at the beginning, these tools will be described in detail in Deliverables 3.2., 3.3. and 3.4.

Regarding, in particular, the online questionnaire, the topics to be investigated and the related questions are defined on the basis of the dimension and sub-dimensions to be assed, but will be organised in order to help SMEs compile it. Following the examples of tools already adopted by other organisations/projects (in particular, the project TURISICO), the choice is to structure it into three main sections (see table 4):

- the SME general vision on innovation
- the development and management of digital processes
- the use of digital technologies

Within each section, some sub-dimensions related to level of SME maturity and readiness will be checked through appropriate questions, the answer to which will allow to build the indices.

Table 5 – Structure of the assessment questionnaire

Section 1 – The SME general vision on innovation	
Maturity	**Readiness**
Strategy & Leadership	External Communication & Network
Skills	Differentiation of Expertise
Digital Enablers	Cross-functional Communication
Section 2 – Development and management of digital projects	
Maturity	**Readiness**
Products/ Processes	Critical Knowledge
Data Awareness	Gatekeepers
Section 3 – Use of digital technologies	
Maturity	**Readiness**
ICT Infrastructure, Resource and Use	

In order to verify that the overall proposed methodology is effective for measuring digital maturity and readiness and for clustering the selected businesses and that the questionnaire is easy to fill in, a testing phase will be planned. In particular, as explained in the following figure, a field test with 2 different SMEs (1 innovator and 1 laggard) will be carried out and, according to it, indicators will be revised – if needed – and the final assessment model will be finalised, including the questionnaire and the protocol for the self-assessment online survey and the direct investigation.

However, as mentioned in the previous paragraph, the methodology developed and described in the present report, is a proposal that, despite the validation after the testing phase, may be subject to changes and revisions, after concluding the survey and the participant observations. Indeed, only with the analysis of the data and information of the firms selected to take part in the Euro-Emotur project, it will be possible to confirm that the dimensions and sub-dimensions here identified are effective in assessing tourism SMEs digital maturity and readiness and in clustering businesses according to their level of maturity/readiness.

Figure 7 – The steps for the development and testing of the assessment model
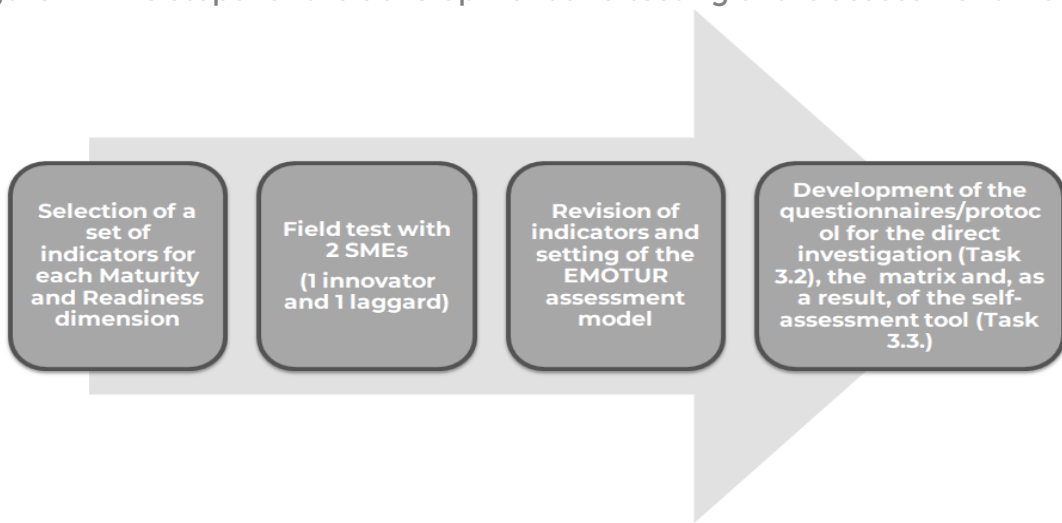
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