

Are enterprises from lagging regions digitally connected?

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Abstract — This study focuses on how enterprises located on lagging regions are using online resources and how can they enhance their usage. Most companies have transitioned to the “online world”, however, in rural and more deprived regions, it is perceived that companies still have difficulties accessing some online resources or accessing qualified workers in ICT areas. As such, this paper focus on 29 enterprises from the northeast of Portugal, a recognized lagging region. In the context of an international project, CRECEER - creation of business cooperation networks in rural cross-border regions between companies in the gourmet agri-food and tourism sectors, the use of ICT was analysed, what online tools were used and what could be done to improve their ICT use in their business.

As a result, it was found that the majority of the companies only had a minimal investment in business online tools, they are not aware of the majority of cloud computing software, and they do not use it in their business. Even though the studied companies were willing to evolve digitally, they recognized the severe restrictions they had, namely the requirement of specific currently unavailable knowledge, the necessity of qualified workers that they couldn't afford, and even the hardware necessity they couldn't suppress.

It is clear that for these companies had it not been the CRECEER project, even the smallest changes and improvements, would not be achieved in a short period. It is rather crucial to have European funds dedicated to enhance the ICT competencies of these businesses.

Keywords - *Cloud computing software; Digital transition; ICT knowledge; Rural regions.*

I. INTRODUCTION

Currently, the internet is present in every aspect of our lives and has a growing importance in the consumers' information search and buying process. According to [1] companies need to pursue a more active role regarding their online presence and their reputation. It is important to understand that customers appreciate and are influenced by the management interaction and response. On the other hand, to do so, companies need to have digital competencies and infrastructures. In fact, digitalization gives micro-enterprises and rural areas new opportunities, and it can provide for their competitiveness [2].

This is more critical in rural areas, particularly those that are characterized as isolated, depopulated, or deprived regions. Even though economic sustainability, in regions with these characteristics, is very hard to maintain, there are still companies that continue their activity and remain there and, therefore, need to attract visitors to the region and to their businesses.

However, rural regions tend to be remote, have lower average levels of education and skills, and frequently have a lower quality of the data infrastructures. This is a central aspect of this paper, stating that with better Internet services, these rural regions could access to better services and information and could overcome their remoteness [2].

This paper focus on 29 rural enterprises, touristic accommodations, and manufacturing of gourmet endogenous products, located in the regions Douro and Terras de Trás-os-Montes, in the northeast of Portugal. It is the intention of this paper to understand if these companies use the information and communication technologies (ICT) available, if they have an efficient presence online, and if they have a digital marketing strategy in order to attract customers and how they implemented the expert's analysis and solutions provided by the CRECEER project.

The paper is structured as followed: first an introduction is presented, secondly the theoretical framework that sustains the study is described, the third section describes the results, and finally, the conclusion is presented.

II. BACKGROUND

At present, all over Europe, numerous countries face serious challenges due to a considerable population decline, that tends to be larger in rural areas. These areas are characterized as having and elderly population and having small economic activity, which implies fewer employment perspectives and lower wages [3].

In rural areas, particularly those that are characterized as isolated, depopulated or deprived regions, companies also have to be up to date with market mechanisms, specifically with communication and promotion techniques [4]. The businesses

located here, like in other regions, are progressively more dependent to digital expectations and conditions, due to customers reality where Internet access is expected, in a regular and available access [5].

The internet, today, is present in every aspect of our lives and has a growing importance in the consumers' information search and buying process. According to [1] companies need to pursue a more active role regarding their online presence and their reputation. However, rural regions tend to be severely disadvantaged in terms of digital infrastructures [5].

The fact is that for a small rural business to be competitive it needs to have a market-oriented strategy and the use of information and communication technologies have a positive influence in the results obtained [6]. However, not only the knowledge to use the internet and digital tools is sometimes harder to find, even the physical support can be a challenge, since rural and more isolated regions usually have a worse internet telecommunication and have more difficulties in using the full potential that digital tools allow [7].

Furthermore, the companies, more than the necessity to be online, in order to appear in customers' search and have a possibility of being selected and their services or products bought, they need to understand the digital tools that are available to improve their services [8].

Although is widely assumed that most companies have engaged in the digital transformation, there are many companies that are digitally connected and many that are not, especially those located in lagging regions [5]. It is accepted that even the existence of a broadband is enough to provide opportunities for rural businesses and can help reduce the isolation from the main markets [5].

The provision of broadband and better infrastructures could promote digital inclusion. The use of information and communications technologies (ICT) can provide benefits to micro or SME, namely by enhancing growth potential, promoting better social and public services support, making available information and resources [5].

With the broadband, one can go a step forward and use, for instance, cloud computing. According to the National Institute of Standards and Technology (NIST), "Cloud computing is a model for enabling convenient, on demand network access to a shared pool of configurable computing resources (for example, networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction [9]. Again, one can observe that SMEs in rural regions, even though they recognize the benefits that arise from this computing paradigm, there are few that adopt them [10]. The "significant predictors of cloud computing adoption are performance expectancy; effort expectancy; absorptive capacity; data security and privacy; and perceived trust" [11]. When companies implement cloud computing it influences positively the performance [11].

Cloud computing allows companies to share the tangible and intangible aspects of an IT infrastructure and share the computing costs between them, thus, having a smaller initial investment and lower operational costs [9].

Even with all the impact and significance, already recognized, of digital tools for businesses, it is important to understand how companies located in more isolated areas can use these resources, or even if they are available to be used. In rural areas, the difficulty of implementing ICT is related to poor infrastructures and insufficient ICT knowledge [2].

The regions in study are Douro, that comprises 19 municipalities, and Terras de Trás-os-Montes, that comprises nine municipalities. Both the regions are located in the northeast of Portugal, occupying an area of about 8,000 km², and are defined as isolated, deprived regions with a galloping aging population. Most of the 28 municipalities on both regions are not highly populated or even in touristic routes. The majority is located in the isolated and underpopulated areas. This study focus on rural accommodation and gourmet endogenous products companies located in three municipalities with critical indicators, regarding economy, population, and tourism, namely Vila Flor, Freixo de Espada à Cinta and Torre de Moncorvo. In these municipalities, in 2016, 98% of the registered businesses were micro companies with two employees, on average [12;13].

III. METHODOLOGY

This research seeks to evaluate the companies located in the Douro and Terras de Trás-os-Montes regions, and focusing on a major trend that thrives in the region: endogenous products with gourmet potential and rural accommodations. The intention was to understand the main difficulties that these companies face, their business expectations and how they perceive their use and need of ICT. With this information, under the CRECEER project, it was intended to present a "current situation report" and to propose better options to increase these companies competitiveness and do the follow up.

This work regards the analysis of 10 rural accommodation enterprises and 19 manufacturing companies of gourmet endogenous products with the intention to understand in what stage of engagement the enterprises were regarding the ICT usage on their businesses.

To do so, the methodological framework used in the project was interpretative and supported by qualitative research, and 29 in-depth semi-structured interviews. The interviews were audio recorded with an average duration of one hour. The interviews were transcribed, and a qualitative content analysis was conducted using NVivo software, to code the transcript text and to identify important themes. After the initial in-depth interview, an in-depth follow up was made with each company in order to understand in loco how they used ICT.

IV. RESULTS

According to regional experts, as the regions have small domestic markets, potential growth should come from increasing the number of visitors to the region and developing online promotion and marketing to increase sales. As such, it was also intended to understand the knowledge and use of ICT by companies. To this end, a qualitative approach was followed, and 39 companies were interviewed using an in-depth interview. The collected data were analysed according to context analysis. The interview focused on three main axes: characterization of the company; innovation, competition, internationalization and use of ICT.

All the companies studied were of micro or small size. The information was obtained through the owner or responsible for the activity, since they were considered as the ones that had a broader view of their business and since they are the ones that can approve and implement upgrades that could evolve from this study.

The first aspect that was analysed was the use of information and communication technologies, described in six topics, starting from the existence of basic equipment until the existence of own server, as presented in Table I.

Table I. Use of information and communication technologies

Use of ITC	yes	no
The company has informatic equipment?	22	7
The company has its own server?	1	28
The company uses billing software?	17	11
The company uses a specific management software?	7	18
The company has internet connection?	18	11
The company has a printer?	20	8

Table I shows that most of the studied companies only had the minimum requirement to have their company running. The majority has a computer and a printer, however, almost half do not have internet connection. From the 29 companies, more than half already uses a billing software and 20% also use a management software.

When asked about ownership or use of any cloud computing service over the internet, the obtained answers are presented in table II.

Table II. Cloud usage models

Use of cloud computing service over the internet	yes	no
Does the company own or use any cloud computing service over the internet?	23	6
Does the company use any cloud computing software (SaaS)?	2	27
Does the company use any cloud computing platform (PaaS)?	0	29
Does the company use any cloud computing infrastructure (IaaS)?	0	29

Table II clearly indicates that almost all of the studied companies didn't use any cloud computing software. Even though the majority stated that they did own or used cloud computing service over the internet, they could not identify one service that fitted here. From the six companies that stated "no" to that question, five were unaware of what cloud computing services were.

Along the interviews, the companies were also questioned about the use of productivity tools. This question divided the answers, as can be observed in Table III.

Table III. Use of cloud software - Productivity tools

Use of cloud software	yes	no
Does the company know of any cloud-based productivity software?	14	15
Does the company use any cloud-based productivity software?	10	19
Does the company use a cloud-based email platform?	20	9
Does the company use cloud-based office tools? (e.g., Office365, Google Docs)	13	16
Does the company use any cloud storage tool? (e.g., GDrive, Dropbox)	17	12
Does the company use any cloud note or calendar management tool?	16	13

In Table III it is clear that the ones that knew and the ones that didn't knew about cloud-based productivity software, were divided in half, however, this division becomes more unbalanced when it comes to the use of that software where only a third of the companies says that they do use it.

The companies were also questioned about the knowledge and use of cloud software, specifically ERP (Enterprise Resource Planning), and the results exhibit a much harder picture (Table IV).

Table IV. Use of cloud software - ERP

Use of cloud software - ERP	yes	no
Does the company know what an ERP software is?	10	19
Does the company use ERP software?	9	20
Does the company use cloud-based ERP software?	1	28
Does the company plan to change the billing/management software currently used?	0	29
The company would be available to change the software currently used to a version cloud?	0	29

Regarding Enterprise Resource Planning (ERP) software, of the 10 companies that knew about it, nine already used it, but only one of them used cloud-based ERP software. The rest of the interviewed never heard about this tool. All of the interviewed stated that they were not willing to change their management software or even change to the same software in a cloud version. This resistance to change was due more to be afraid of unknow software than due to current satisfaction with the services they have.

Finally, this part of the interviews asked about the knowledge and use of cloud software, specifically CRM (Customer Relationship Management), and in this topic the results are alarming, as seen in Table V.

Table V. Use of cloud software - CRM

Use of cloud software - CRM	yes	no
Does the company use CRM software?	0	29
Does the company use cloud-based CRM software?	0	29
Does the company see the possibility of obtaining CRM software?	0	29

Customer Relationship Management (CRM) software not only was not used by any of them, but none of the companies ever heard about it.

The interviews presented a difficult image regarding the digital transition of this rural companies. Even though rural accommodation enterprises have a slightly better knowledge and usage of cloud computing software, it was not a relevant difference.

In the digital transition, these micro and SME are lagging behind. The results are in line with the findings of [10], that state that “although digitalization provides SMEs with new opportunities to enter the global market, evidence shows that SMEs are still behind large firms when it comes to digital transition or technology adoption”. Furthermore, it was clear that the companies were connected and had an online presence (almost all had social media networks and websites), but when it came to study enterprise resource planning (ERP) or customer relationship management (CRM) they were far behind companies of larger dimensions and located in urban areas. This is a confirmation of the theoretical review where [10], defended that there is a large gap between large organizations and SME when it comes to cloud computing adoption.

At this point, the CRECEER project, had done the analysis of the 29 companies involved and the reports were concluded. However, before working with the companies to implement the necessary changes, it was determined that some workshops should be taught in these topics, not only to make the companies aware of what is available online, but also to demonstrate the potential of the existing cloud computing software to their businesses. The workshops focused on cloud computing software and was open not only to the 29 companies involved in the CRECEER project, but also to other regional companies, since this was a topic of extreme importance for the regional entrepreneurs. This was considered to help the following step, where it was expected the adoption of the proposed changes.

After the workshops the participants were asked to evaluate the knowledge, they acquired. The response was very positive since the majority found that digital transition was possible and achievable in their companies.

After the study, the conclusions were presented to the 29 companies with suggestions to improve their businesses through the use of cloud computing software. The suggestions were very welcome by the companies particularly those that did not required an investment. The suggestions regarding the digital transition that had more resistance were those where the companies feel that to achieve the expected results they had to invest in more support, such as expertise workers. However, even with these constrains, it was possible to work with the majority of the companies, presenting the proposed changes and working with them as consultants to implement the ones that were possible and required a small investment.

For a proper digital transition, they all sustained that they wanted to achieve that, but it was very difficult to invest due to economic restrictions and they expected to do so with the help of European Union funds. This was very much referred by the interviewed that the international projects’ support was essential

to improve these types of companies’ conditions, so they can compete with other companies and other markets.

V. CONCLUSIONS

This paper presents a reality of the tourism accommodation and manufacturing of gourmet endogenous products companies in a lagging region. These companies face several problems regarding their location, far from the touristic centres and with difficult commercialization of their products in external markets.

Even though the majority already has a digital presence, they are aware of their disadvantages, namely poor connectivity that conditionate their businesses. They were not aware of what digitalization could do for their business, and even after recognizing the potential impact, they consider difficult to invest the necessary amount due to economic constrains, because most of the companies only makes just above breakeven point.

From this study, it can be state that these companies from the studied lagging regions are not digitally connect.

It was also confirmed what the companies already had, in terms of ICT, and presented several actions and measures to be taken in order to enable their digital transition. At this point it is relevant to enhance the importance of financed projects, such as the ones from the European Union, to help these companies to take a step forward regarding digitalization so they don’t fall behind in the competitive and worldwide digital economy.

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