A gender-oriented analysis of digital skills and ICT use intensity in tourism companies in Extremadura (Spain)

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Abstract

Purpose – This study aims to use a novel approach, focusing on the manager's gender, to explore whether it acts as a differentiator in the following aspects of tourist accommodation companies in Extremadura (Spain): the level of information and communication technology (ICT) specialisation of employees, managers' knowledge of ICTs and the social media and online tourism platform use intensity of managers.

Design/methodology/approach – A questionnaire was sent to 238 accommodation companies. The data collected from the questionnaire were analysed using statistical inference techniques and linear and logistic regression.

Findings – In general, ICT specialist profiles are more common amongst the employees of male-led companies. Male managers also use Booking and analyse online feedback more intensively. There appear to be no gender-based differences in terms of the ICT knowledge of managers.

Practical implications – These results highlight issues of major practical interest for the sector's managers and decision makers, especially in Extremadura. They reveal the digital divide in certain aspects between men- and women-led firms in Extremadura. This finding has important consequences for the sector in terms of competitiveness. It highlights the need to continue working to eradicate gender gaps in digital settings.

Originality/value – The study shows the role of the manager's gender as a differentiating factor in terms of the existence of specialist ICT profiles and ICT use intensity in tourism companies. To the best of the authors' knowledge, this study provides the first evidence of such a finding for the tourism sector in general, as well as for the specific case of a rural destination such as Extremadura.

Keywords Gender diversity, Managers, ICT, Tourism companies

Paper type Research paper

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1. Introduction

The key role of information and communication technologies (ICTs) in today's business environment has been widely acknowledged, given the range of benefits they bring to different organisational processes. Consequently, knowledge of the factors that condition the use of ICTs by companies is a matter of considerable interest. Of these factors, gender is a notable differentiator in the use of ICTs for several reasons. For instance, certain barriers limit women's use of technologies. Social stereotypes about gender negatively affect women's technology skills through their influence on ICT training (Figueroa-Domecq *et al.*, 2020). Consequently, women have been found to have lower science skills and to be less well trained in technology (Sáinz *et al.*, 2016). These technology-related differences are observed at different organisational levels. For example, in the organisational hierarchy, there is evidence that women in management positions have weaker digital skills than their male counterparts (Zeike *et al.*, 2019) and are less likely to use digital technologies (Orkoh and Viviers, 2021).

Despite these arguments, gender-oriented studies of the use of ICTs in companies are still scarce. Specifically, there is a notable lack of studies of the role of the manager's gender. Some examples are the studies by Zeike *et al.* (2019), Orkoh and Viviers (2021) and Kusuma *et al.* (2020), with the first two showing differences in ICT use according to the leader's gender, in favour of men. The lack of such research is of particular concern, given the vast literature on the influence of corporate governance on all areas of the organisation and the literature on the key role of the manager's gender in companies' approach to governance and its effectiveness (Moreno-Gómez *et al.*, 2018).

To address these shortcomings, this paper focuses on accommodation companies in Extremadura (Spain) to achieve the following objectives. The study aims to show whether female leadership differs from male leadership regarding the employment of ICT specialists. The aim is to determine whether companies managed by men and those managed by women differ in terms of the existence of these specialist profiles amongst employees. The study also aims to analyse whether there are gender-based differences in the degree of ICT knowledge of the managers of these companies and the intensity with which they use social media and online tourism platforms to perform their work tasks.

To achieve these research aims, data were collected using a survey of 238 accommodation companies in Extremadura. Most interviewees were entrepreneurs who started their own small businesses which they now run (80.7% of the sample). The data were subsequently analysed using statistical inference and linear and logistic regression. The results indicate that specialist ICT profiles are more common in companies managed by men. However, there is no gender gap in the ICT knowledge of managers. In general terms, for most social media and online platforms for tourism, the intensity in the use of these tools within the sector does not differ between men and women managers. However, male managers are more concerned about online reputation.

The tourism sector was chosen because of the difference that the adoption and use of ICTs can make in the operations of companies in the sector. For example, ICTs mean not only better overall company performance but also greater ability to attract guests (Berné *et al.*, 2015). Regarding the geographical setting, Extremadura is an emerging inland tourist destination, with huge growth potential, given its rich resources in terms of heritage. However, its tourism sector is characterised by low demand, the insufficient adoption of technology tools, the scant use of marketing channels and a tourist orientation with considerable room for improvement. Consequently, tourism companies in Extremadura need to adopt suitable technology infrastructures and the efficient use of ICTs (Junta de Extremadura, 2022).

This study shows the role of the manager's gender as a differentiating factor in terms of the existence of specialist ICT profiles and ICT use intensity in these companies. To the best of the authors' knowledge, these results provide the first evidence of such a finding for the tourism sector in general and for the specific case of a rural destination such as Extremadura. The only study that provides evidence of ICT use in the tourism sector is that of Olsson and Bernhard (2021). However, their study did not address possible gender differences in ICT use and knowledge.

This paper has five sections, including the present introduction. Section 2 reviews the studies addressing the relationship between women and ICTs, focusing on women in management. Section 3 explains the sample selection and method used in this study. Section 4 outlines the interpretation and discussion of the results of the analysis. Finally, Section 5 presents the conclusions, limitations of the study and future lines of research.

2. Gender profiles in information and communication technology use: a literature review

2.1 Gender and technology: theoretical foundations

The gender digital divide refers to differences between men and women in terms of men's greater access to technology and knowledge of how to use it (Novo-Corti *et al.*, 2014). Such differences are rooted in the stereotypes associated with a patriarchy-dominated society (Alozie and Akpan-Obong, 2017). These differences are justified by the gender socialisation process, which moulds people's behaviour, steering them towards a traditional role system where the male gender is dominant (Hetherington, 1965). Hence, based on social role theory (Eagly, 1987), individuals adopt certain behaviours according to what is expected of them in their environment. Based on these foundations, a series of explanatory factors for the gender digital divide emerge.

Firstly, it is worth noting women's lower level of technology education. According to González-Pérez *et al.* (2020), women are clearly under-represented in science, technology, engineering and mathematics (STEM) degrees. This situation may be due to the gender stereotypes that lead women to focus on serving others, whereas men focus on using objects. Consequently, women lack an orientation towards using objects such as electronic devices. Thus, they are less motivated to develop a grasp of technology (Sáinz *et al.*, 2016).

Secondly, a lack of financial resources is also a barrier to women's use of technology. Many women often do unpaid work such as housework and childcare. They are, therefore, often financially dependent on men. In addition, the domestic workload of women is so great that they lack time to engage in other activities that would allow them to develop in areas such as technology (Olatokun, 2007).

Thirdly, the idea that behavioural expectations projected on people influence their decisions is also important. For instance, the social phenomenon of "stereotype threat" occurs when an individual is afraid of confirming negative stereotypes. This phenomenon explains why women may be fearful of rejection when entering a male-dominated field such as technology (Blackburn, 2017). Furthermore, according to the theory of learned helplessness (Seligman, 1972), women may believe that technology is not for them. They may reach this conclusion having internalised their lack of competence in technology and their feeling of inferiority in ICT use because of previous negative experiences with ICTs. This situation creates a lack of confidence and insecurity, ultimately leading to a low level of ICT use (Bhushan, 2008).

2.2 Gender differences in information and communication technology use: a literature review

At the international level, much of the empirical evidence shows a low degree of ICT use by women, as well as low participation by women in technology-related areas. Most studies have focused on urban settings, with Africa receiving more attention than any other continent. For instance, Alozie and Akpan-Obong (2017) found that it is less likely for women to use ICTs. Orkoh and Viviers (2021) reached a similar conclusion, reporting that women-led firms in Africa are less likely to use digital technologies. This finding may be because of economic hurdles, which lead women to use mobile phones as their main form of ICT because they enable communication, yet are cheap to acquire and maintain (Kwami, 2015). Similarly, Olatokun (2007) reported difficulties in access to technology after studying women academics. However, these women do manage to perform activities related to data processing, information search and the preparation of class materials. This positive trend in the use of ICTs was also reported by Mulauzi and Albright (2009). Similarly, Ukpere *et al.* (2014) found a growing and increasingly complex level of ICT use by women entrepreneurs.

Continuing with the focus on urban settings, gender differences in the use of technology have also been found in Asia. For example, Bhushan (2008) used a sample of 48 female learners on a bachelor's distance degree programme in Computer Applications in India to show the existence of a technology gap between men and women. Chew *et al.* (2011) found that less than 10% of 231 women micro-enterprise owners in India use their mobile phones to manage their businesses. However, despite the differences between men and women, the manager's gender was not found to be a conditioning factor in terms of implementing strategies to create a revolution in ICT adoption in small- and medium-sized enterprises (SMEs) in Indonesia (Kusuma *et al.*, 2020).

Focusing on a large German ICT company, Zeike *et al.* (2019) found that women in management positions have poorer digital skills and are less likely to use ICTs than their male counterparts. Regarding technology use, Nord *et al.* (2017) showed that Italian women use ICTs extensively at the workplace.

A notable study of gender differences in ICT use in urban areas of America is that of Mack *et al.* (2017). They showed that women entrepreneurs are more reluctant to adopt ICTs. These differences are observed not only in the use of ICTs but also in technology-related decision-making. For example, Bendell *et al.* (2020) showed that women entrepreneurs of SMEs in the USA are less likely to invest in the purchase of new technologies.

In Oceania, the study by Sharafizad (2016) is worthy of mention. After interviewing 25 women business owners in Australia, the authors found that women's level of ICT use is growing and becoming increasingly complex. Alam *et al.* (2022) interviewed 281 SME managers in Australia. They concluded that the manager's gender influenced the digital transformation of these firms. Women were observed to use social media more than men.

Although most research has focused on urban settings, some studies have examined rural areas. Evidence has been found exclusively for Africa, Asia and Europe. In the case of Africa, one notable study is that of Scott *et al.* (2004), who found gender disparities in the use of telecommunication services with respect to women's lower use of messages and the internet. They supported their findings by arguing that women often have less access to technology because they live in rural areas or are less well educated. Similarly, Jiyane and Mostert (2010) studied a sample of women entrepreneurs in South Africa, finding that their use of ICTs was limited to communication and dissemination of information through mobile phones because of financial constraints.

Along the same lines, albeit in a different region, Ma *et al.* (2020) surveyed 493 farmers in China. They highlighted the differences between female and male farmers with respect to

the level of use of smartphones, with male farmers being more likely to use this technology. This finding may be a result of gender inequalities in access to this type of ICT. Similarly, research by Best and Maier (2007) has shown a gender-based digital divide in rural Indian women's use of and access to ICTs, mainly due to barriers such as a lack of training, time or security and privacy. Finally, according to the study of Olsson and Bernhard (2021) in Sweden, women entrepreneurs are aware of the importance of keeping abreast of the latest technology, constantly updating their digital knowledge to manage their social media and remain competitive in the tourism sector.

This review implies that most studies report gender-based differences in ICT adoption and use in favour of men. The disparity appears to be greater in rural contexts or less-developed countries. This situation may arise because the causes of gender differences in ICTs, such as a lack of education and resources, are exacerbated in such contexts. Nevertheless, some studies have shown a growing trend in the use of ICTs by women.

2.3 Gender profiles in information and communication technology use in Spain: a literature review

In Spain, the findings regarding gender differences in ICT use are contradictory. The conflicting nature of these findings may be due to the differences between the samples used in different studies. For example, Novo-Corti *et al.* (2014) focused on the differences in ICT skills and attitudes of the rural population in the region of Galicia, finding a gender-related digital divide that leads to a low level of ICT use by women. They justified their results by citing the large gender inequalities in Galician society, which hinder women's access to technology.

In parallel, several studies have examined gender disparities in relation to the level of technology education or training. For example, Fernández-Batanero *et al.* (2019) reported results that differ from those of all other sources from the literature review in this study. They found that female teachers consider themselves to be better trained than their male counterparts in the application of ICT for students with disabilities. However, the study by Ortiz-Colón *et al.* (2020) provided the opposite result, indicating that male teachers perceive themselves as having better technology knowledge than women teachers. Sánchez-Prieto *et al.* (2020) focused on dual education teachers, finding the absence of significant differences between women and men in terms of basic ICT knowledge.

Finally, Grande-De Prado *et al.* (2020) analysed gender differences in terms of digital skills for a sample of students, finding that women and men have different levels of ICT training depending on its purpose. For instance, women claim to be more proficient in social media, Word processing, image processing and graphic design, whereas men perceive themselves as more competent in information management and problem-solving through technology.

In sum, at the international level, most of the empirical evidence suggests a low level of ICT use by women due to numerous barriers that hinder their access to technology. These barriers relate particularly to the socio-economic context and the lack of education, training and income. By contrast, in the specific case of Spain, the results do not reveal a clear consensus, with studies diverging greatly in terms of their samples. Nevertheless, based on the numerous reasons for the differences between men and women observed in different organisational and geographical settings, the following hypotheses are proposed:

H1. The existence of specialist ICT profiles amongst the employees of tourist accommodation companies in Extremadura differs between male-led companies and female-run companies.

H2. The ICT knowledge of managers of tourist accommodation companies in Extremadura differs according to their gender.

H3. The intensity with which social media and specialised technology platforms are used by the managers of tourist accommodation companies in Extremadura differs according to their gender.

3. Methodology

3.1 Sample

For this study, a random sample of 238 companies was taken from the population of all tourist accommodation companies in Extremadura. The sample represented approximately 15% of the total population. For the worst case (i.e. $p = q = 0.50$) at a confidence level of 95%, the maximum sampling error when considering both the sample size and the population universe was $\pm 5.9\%$.

The sample data were gathered using a self-administered questionnaire sent through Google Forms between February and July 2020. The questionnaire had an estimated duration of 15–20 min. It was designed from a gender perspective and was composed of qualitative and quantitative items. These items were structured into three thematic blocks. Specifically, the items were related to the existence or absence of specialist ICT profiles, whether or not managers have knowledge of different technologies and these managers' use of social media and specialised online platforms.

Most managers of the surveyed companies had a university education (46.6%). The most common legal forms of the tourism companies in the sample were sole proprietorship (63.9%) and limited liability companies (23.5%). The average age of the companies was 12.5 years. The average number of employees was 7.3. Approximately 44% of employees were women.

To carry out the analysis for this study, the sample was first divided into two groups according to gender. In the first group, the manager of the tourism company was male (110 male managers) and in the second group, the manager was female (128 female managers). This strong balance in the size of the sub-samples ensured the reliability of the comparisons studied in this paper.

3.2 Analysis procedure

The aim of this study was to explore the possible presence of a gender gap in ICT use. Therefore, for dichotomous questionnaire items (i.e. presence or absence), such as the presence of specialist ICT profiles, the degree of knowledge of ICT technologies or the use of analysis of customer comments, cross tables were constructed. The columns show the results for male and female managers of the consulted companies, respectively. The independence between rows and columns (i.e. absence of a gender gap) was tested using a chi-squared test of independence. For quantitative items such as the intensity of use of social media and online platforms, a *t*-test for the null difference of means (i.e. absence of a gender gap) was used. The hypothesis of homoscedasticity of variances was previously tested in such cases.

In some cases, the hypothesis of absence of a gender gap was rejected. In such cases, a second phase of empirical analysis was performed to ascertain the reasons for the gender differences. For this purpose, a logistic regression model (for dichotomous-dependent variables) or a linear regression model (for quantitative-dependent variables) was used to determine the statistically significant exogenous variables that would explain the

previously detected gender differences. Specifically, the characteristics of the companies identified through the questionnaire items were used. These variables are as follows:

(a) Level of education of the manager:
- EDUC1: the manager has completed upper secondary education (1 = yes; 0 = no).
- EDUC2: the manager has completed vocational training (1 = yes; 0 = no).
- EDUC3: the manager has completed university studies (1 = yes; 0 = no).

If EDUC1 = EDUC2 = EDUC3 = 0, then the manager has completed compulsory secondary education, school diploma or no studies.

(b) Type of company:
- ENT1: the company has joint ownership (1 = yes; 0 = no).
- ENT2: the company is a business partnership in the form of a public limited company or private limited company (1 = yes; 0 = no).

If ENT1 = ENT2 = 0, then the top manager of the company is the sole proprietor or an entrepreneur.

(c) Age of the company (in years) (SEN).

(d) Number of employees in the company (EMP).

(e) Percentage of female employees in the company (FEM).

In all cases, one model was estimated for male managers and another for female managers. It was thus possible to determine which business characteristics explain the existence of the previously detected gender differences.

4. Results and discussion

The first analysis examined the presence of specialist ICT profiles amongst the employees of the tourist accommodation companies in Extremadura. Table 1 shows that specialist ICT profiles are very scarce in the sampled companies. To determine the possible existence of a gender gap in terms of the presence of these specialist ICT profiles depending on whether the company manager is male or female, a chi-squared test of independence was performed using the contingency table presented in Table 1. At the 5% significance level, there is evidence that the manager's gender is not independent of the presence of these specialist

Profile	Men managers (%)	Women managers (%)
Affiliate marketing specialist	0.9	0.0
Branded Content Manager	1.8	0.0
Community Manager	17.3	14.8
CRM Manager	6.4	0.8
Data Scientist	5.5	0.8
SEO/SEM Specialist	8.2	4.7
Service Design Strategist	5.5	3.1
Virtual Reality Developer	0.0	0.8

Notes: Chi-squared = 18.030; df = 7; p-value = 0.012
Source: Authors' own creation

Table 1. ICT specialist profiles in the sampled firms by manager's gender

profiles in the sampled companies. That is, there are gender differences. Specifically, specialist ICT profiles are more common in companies managed by men than in women-led firms.

The identified gender gap was studied in greater depth. Considering only the four profiles for which the differences between the two groups of firms were most pronounced (Table 1), two binary logistic regression models were estimated using the explanatory variables presented earlier. The dependent variable indicates whether the corresponding ICT specialist profile was present or not. The results of the estimation of these models are presented in Table 2.

The probability of having a Community Manager profile in companies managed by men is higher when it is a joint ownership company or a business partnership than when it is managed by a sole proprietor or an entrepreneur. On the contrary, in companies managed by women, the probability of having a Community Manager does not depend on the type of company. Also, in companies managed by men, the number of employees has a positive influence on having a Community Manager: the greater the number of employees in the company, the greater the probability of having a Community Manager profile.

In the case of the Data Dcientist profile, the only factor that explains the gender gap is the number of employees. A higher number of employees indicates a higher probability of having this profile in companies managed by men. The number of employees does not affect the probability of having this profile in companies managed by women. The only business variable that explains the existence of a gender gap in having a search engine optimisation (SEO)/search engine marketing (SEM) specialist profile is company age. Older companies are more likely to have this profile when they are run by men. In the case of women-run companies, company age does not affect the probability of having an SEO/SEM profile. Finally, the business characteristics considered in this paper do not explain the gender gap in the customer relationship management manager profile.

The next area addressed in this study was the level of knowledge of the managers of tourist accommodation companies in Extremadura regarding different ICTs. The results, broken down into companies managed by men and women, appear in Table 3. The surveyed managers' level of knowledge of ICTs is generally quite low. The most well-known technology is cryptocurrencies, whereas the least well-known one is augmented reality.

Table 2.
Binary logistic regression results for four profiles of ICT specialists in Extremadura (Spain)

	Community manager		CRM manager		Data scientist		SEO/SEO specialist	
Dependent variable	Men	Women	Men	Women	Men	Women	Men	Women
Constant	*(–)	*(–)					*(–)	*(–)
EDUC1								
EDUC2								
EDUC3								
ENT1	*(+)							
ENT2	*(+)							
SEN							**(+)	
EMP	*(+)				*(+)			
FEM								
Nagelkerke R^2	0.372	0.082	0.404	0.454	0.329	0.454	0.144	0.147

Notes: *Variable statistically significant at 5%, ± denotes the sign of the coefficient; **variable statistically significant at 10%, ± denotes the sign of the coefficient
Source: Authors' own creation

Despite certain differences between men and women's knowledge of smart home assistants, for the other technologies, the level of knowledge is very similar for both genders. To confirm these minimal differences, the chi-squared test took a value of 4.424, with an associated significance of 0.619. Therefore, the hypothesis of independence between gender and level of knowledge of ICTs cannot be rejected. In conclusion, there is no gender gap in the level of ICT knowledge of managers of tourist accommodation companies in Extremadura.

Social media and online platforms have become basic tools for managing tourism companies in recent years. Therefore, these tools were analysed. The results appear in Tables 4–9. These results are used to characterise the use of these tools by managers of the sampled companies according to their gender. This analysis addresses the study aims. Data are provided on managers' perceived intensity of use of these technologies and on managers' reported use of these technologies for the analysis of customer behaviour and interaction with customers.

Firstly, the surveyed managers were asked to rate the intensity with which they use the leading social media sites (Facebook, Twitter, Instagram, LinkedIn and YouTube) and the most useful and relevant online platforms for the sector (Booking and Tripadvisor). They recorded their responses on a Likert scale ranging from 0 (*no use*) to 5 (*very intensive use*). Assuming that this six-point Likert scale forms a continuum, the average use intensity for these social media and online tourism platforms was calculated, as well as the associated standard deviation in each case. These results are presented for both male and female

Profile	Male managers (%)	Female managers (%)
Big data	32.7	29.7
Cryptocurrency	35.5	36.7
Artificial intelligence	30.9	28.9
Internet of things	29.1	28.1
Cloud computing	29.1	31.3
Augmented reality	26.4	27.3
Smart home assistants	23.6	35.2

Notes: Chi-squared = 4.424; df = 6; p-value = 0.619
Source: Authors' own creation

Table 3. ICT knowledge of managers in the sampled firms by manager's gender

Social media and online tourism platforms	Male managers Mean use intensity	Male managers Standard deviation	Female managers Mean use intensity	Female managers Standard deviation	Difference of means	t-test	p-value
Booking	3.527	1.728	3.086	1.832	0.441	1.902	0.058
Tripadvisor	1.564	1.623	1.563	1.640	0.001	0.005	0.996
Facebook	3.055	1.538	3.109	1.608	−0.054	0.268	0.789
Instagram	1.591	1.869	1.922	1.777	−0.331	1.399	0.163
Twitter	0.918	1.415	0.852	1.475	0.066	0.354	0.724
LinkedIn	0.682	1.211	0.617	1.237	0.065	0.406	0.685
YouTube	1.809	1.699	1.852	1.703	−0.043	0.192	0.848

Source: Authors' own creation

Table 4. Intensity of social media and online tourism platform use by managers of tourist accommodation companies in Extremadura by manager's gender

managers in Table 4. The two most heavily used technology platforms by tourist accommodation managers are Booking and Facebook. In contrast, two social media sites are used very little by the surveyed managers, namely, Twitter and, particularly, LinkedIn.

From a gender perspective, a test of the equality of the mean intensity of use of each platform for men and women was performed using a *t*-test. Variances were considered to be equal following statistical confirmation of this hypothesis using Levene's test. The results of these tests also appear in Table 4. All *p*-values are greater than 10%, with the exception of the *p*-value associated with the *t*-test for Booking (0.058). Consequently, for the specific case of Booking, the intensity of use for male managers is slightly greater (3.527) than for female managers (3.086).

To explain the causes of this gender gap, two linear regression models were estimated. In these models, the endogenous variable was the intensity of use of Booking. The exogenous variables are the cited characteristics of the tourism companies managed by these managers. The results of the estimation of these models are shown in Table 5. At a significance level of 10%, in male-run companies, the intensity of Booking use is higher when there are more employees. This relationship was not observed in female-run companies. However, one factor that contributes to narrowing the gender gap is the legal form of the company. A direct relationship was found between the intensity of Booking use and joint ownership companies managed by women. This relationship was not statistically significant for the same type of company managed by men. Finally, there was a more intense use of Booking in companies where the manager had a bachelor's degree. This relationship was confirmed for both male- and female-managed companies, so it cannot be considered an explanatory factor of the gender gap.

The final part of this empirical analysis consisted of studying how the surveyed managers handle customer comments on social media and online tourism platforms in reference to the customer experience at these tourist accommodation sites. Table 6 shows the percentages of managers who analyse customer comments on social media and online tourism platforms, again according to the manager's gender. The percentage is very high, corresponding to almost all male managers (98.2%) and more than 92% of female managers. To determine whether there are statistically significant differences between these percentages, a chi-squared test was again performed, providing a value of 4.440 with an

Table 5.
Linear regression results for intensity of use of Booking platform

	SEO/SEO specialist	
Dependent variable	Men	Women
Constant	* (+)	* (+)
EDUC1	** (+)	* (+)
EDUC2		
EDUC3		
ENT1		** (+)
ENT2		
SEN		
EMP	** (+)	
FEM		
R^2	0.121	0.129

Notes: *Variable statistically significant at 5%, ± denotes the sign of the coefficient; **variable statistically significant at 10%, ± denotes the sign of the coefficient
Source: Authors' own creation

associated p-value of 0.035. Consequently, at the 5% significance level, it can be concluded that there is a gender gap in the analysis of online reputation by the region's tourist accommodation businesses. Although this practice is almost ubiquitous in the surveyed accommodation companies, it is more prevalent amongst businesses managed by men than amongst women-led companies.

To determine which business characteristics explain the causes of this gender gap, a binary logistic regression model was estimated for each group of firms. The results are shown in Table 7. The only factor that at least partially explains this gap is the legal form of the firms. Specifically, the estimation of the model parameters for companies managed by women indicates that the probability of analysing customer comments on social media and online platforms is lower when the company is a business partnership. However, this relationship could not be confirmed for companies managed by men.

To enrich the previous analysis, the frequency with which managers analyse customer comments was studied for the sub-sample of companies that reported that they analyse customer comments posted on social media and online tourism platforms (226 companies). The frequency with which managers perform customer comment analysis is illustrated in Table 8. Comments are most commonly analysed daily or, albeit to a lesser extent, weekly. In contrast, it is rare for comments to be analysed less than once a week. Unlike the exploration of previous research questions, no statistically significant differences were detected between the behaviour of male and female managers in this regards. The chi-squared test provided a value of 2.837 with an associated p-value of 0.585.

Table 6.
Percentage of surveyed managers who analyse customer comments on social media and online tourism platforms (by manager's gender)

Analysis of comments	Male managers (%)	Female managers (%)
Yes	98.2	92.2
No	1.8	7.8

Notes: Chi-squared = 4.440; df = 1; p-value = 0.035
Source: Authors' own creation

Table 7.
Binary logistic regression results for surveyed managers who analyse customer comments on social media and online tourism platforms

	SEO/SEO specialist	
Dependent variable	Men	Women
Constant		* (+)
EDUC1		
EDUC2		
EDUC3		
ENT1		
ENT2		* (−)
SEN		
EMP		
FEM		
Nagelkerke R^2	1.000	0.164

Note: *Variable statistically significant at 5%, ± denotes the sign of the coefficient;
Source: Authors' own creation

Finally, the manager's level of interaction with customers who leave comments on social media and online tourism platforms was studied. Considering the customer interaction of male and female-run companies separately provided two 2 × 2 cross-tabulations, as shown in Table 9. The first cross-tabulation shows that almost two-thirds of male managers and 7 out of 10 female managers respond to positive customer comments. Furthermore, the test of the hypothesis of independence between gender and level of customer interaction ($\chi^2 = 1.197$, p-value = 0.274) implies that there are no differences between men- and women-led companies in terms of the degree of interaction between customers and managers.

In the case of negative comments, the level of interaction is slightly higher than for positive comments. However, as with the interaction with positive comments, no gender differences are observed between male- and female-led companies ($\chi^2 = 0.089$, p-value = 0.765).

Following this interpretation, the results of the study are now linked back to the existing literature. Notably, although male-run companies have more specialist ICT profiles than women-run firms, the results on managers' knowledge and use of ICT reveal scarce gender differences. Male managers use the Booking platform more intensively and more male managers use social media and specialised online platforms to analyse customer reviews. Consequently, the results indicate that there are still gender differences in terms of ICT specialisation and the use of these tools in favour of men. However, such differences are not observed in all areas.

Therefore, even though women increasingly use ICTs (Sharafizad, 2016; Nord *et al.*, 2017), there is still evidence of men's greater ICT use. These differences have been observed in various contexts. As reflected by most of the existing evidence, differences between men and women in terms of ICT adoption have been reported in the USA (Mack *et al.*, 2017), Germany (Zeike *et al.*, 2019), Spain (Novo-Corti *et al.*, 2014), China (Ma *et al.*, 2020), India (Bhushan, 2008), Nigeria (Olatokun, 2007) and other contexts.

Table 8.
Frequency of analysis of customer comments by manager's gender (sub-sample of 226 firms)

Frequency	Male managers (%)	Female managers (%)
Daily	40.7	46.6
Weekly	37.0	38.1
Monthly	17.6	11.9
Quarterly	3.7	3.4
Annual	0.9	0.0

Notes: Chi-squared = 2.837; df = 4; p-value = 0.585
Source: Authors' own creation

Table 9.
Level of interaction with customer comments (percentage of surveyed managers who respond to comments by manager's gender)

Response to comments	Male managers (%)	Female managers (%)
Positive comments		
Yes	63.6	70.3
No	36.4	29.7
Chi-squared = 1.197; df = 1; p-value = 0.274		
Negative comments		
Yes	70.9	72.7
No	29.1	27.3
Chi-squared = 0.089; df = 1; p-value = 0.765		

Source: Authors' own creation

This study focused on the management level. The existing evidence in this area corroborates the disparities between managers of different genders in terms of ICT adoption and use (Orkoh and Viviers, 2021; Zeike *et al.*, 2019). These disparities are supported by the results of the present study. However, this study differs from the existing research in that it offers the first evidence of this issue for tourism companies, specifically for an emerging inland tourism destination such as Extremadura.

The aforementioned gender differences are explained by the barriers that women face in accessing technologies. These barriers include technology education, which tends to differ between women and men. This difference is explained by the lower propensity of women to enrol in STEM degrees (González-Pérez *et al.*, 2020).

This phenomenon can be observed amongst women in Spain and, more specifically, Extremadura. Although women account for the majority of university graduates, the opposite is true in the case of STEM degrees, where there is a clear majority of men (Spanish Ministry of Education and Professional Training, 2022).

As a final remark, the results only enable partial confirmation of the hypotheses. *H1* was confirmed, *H2* could not be corroborated and *H3* was only partially corroborated.

5. Conclusions, limitations and future research

This study was based on the analysis of 238 accommodation companies in Extremadura. The aim was to determine whether the manager's gender is a differentiating factor in terms of having specialist ICT profiles, managers' ICT knowledge and the intensity with which managers use social media and online tourism platforms in the running of these firms.

The results confirm the existence of differences in employees' ICT specialisation and in the intensity with which ICTs are used in some areas based on whether the company manager is male or female. Specifically, companies managed by men have a higher proportion of ICT specialists amongst their employees, although employees' knowledge of new technologies in the sampled companies remains insufficient. Regarding the online tourism platform Booking, which is by far the most widely used by accommodation companies in Extremadura, the statistical evidence reveals that male managers make more intensive use of this platform. In addition, although the vast majority of surveyed managers reported analysing customer comments on social media and online tourism platforms, male managers reported a higher level of online reputation analysis.

However, no gender gap was detected in relation to managers' knowledge of ICTs. Similarly, the analysis reveals no difference in the use of Facebook, Instagram, Twitter, LinkedIn and YouTube between managers of different gender. Finally, the frequency of analysis of customer comments, which tends to be daily or weekly in most accommodation companies, is not observed to differ significantly depending on the manager's gender.

Therefore, the evidence shows that there are still gender differences in tourism companies in Extremadura in terms of managers' hiring of specialist ICT profiles and use of ICTs to perform their work tasks. Consequently, the performance of these firms is conditioned by the gap between male-run and female-run firms in terms of ICT adoption and use. This gap is relevant, given the importance of adapting business operations to technological progress in a context of intense digital transformation, where productivity, value creation and competitiveness are closely linked to technological capacity. The digital divide is especially relevant given that Extremadura is an emerging rural tourism destination with huge tourism potential, yet whose companies lag behind in terms of their adoption of ICTs.

In light of these reflections, the findings of this study have important theoretical and practical implications. Regarding the theoretical implications, the study provides evidence

of a gender-based digital divide in a crucial business sector for economic development and in a context that must adapt to the implacable process of rapid technological development. This study highlights the importance of analysing the consequences of gender inequalities and addressing these consequences to ensure better adoption of ICTs in the sector. Such adoption will ultimately lead to superior performance. This study reveals an area where further progress is needed. Namely, there is a need to enrich the understanding of the conditioning factors of technology adoption by companies in general, and tourism companies in particular, from a gender perspective.

These results highlight issues of great practical interest for the sector's managers and decision makers, especially those in Extremadura. Firstly, the digital divide between companies managed by men and those managed by women in Extremadura has serious consequences for the development of tourism in this region, given that ICTs are not being used equally effectively by both sets of companies. Therefore, an important source of competitive advantage is being underused in women-led companies. In addition, the differences based on the manager's gender highlight the need to continue working to eradicate gender gaps in digital settings.

Therefore, managers and public administrations must contribute to the eradication of gender inequalities to boost the performance of companies in various areas such as technology by harnessing people's talent more effectively. For instance, companies should implement human resources policies based on promoting equal opportunities between genders in all areas of the organisation. Meanwhile, governments and political decision makers should promote regulations to correct existing gender inequalities in all areas of society, such as the family, education, employment and institutions.

Finally, this study has certain limitations. Specifically, the region analysed in this study has highly specific characteristics. Therefore, the results can only be reliably extrapolated to similar destinations. The focus of the study was on gender as a differentiating factor in the use of ICTs, although there may be other relevant factors, such as the quality of the ICT educational offering, the provision of specialist human capital and access to funding for digital investment projects. Consequently, the proposal for the future is to replicate the analysis in other similar contexts, enabling comparisons between the results. In addition, it could be of interest to use the same questionnaire to collect data in subsequent years. A longitudinal study could thus be conducted to analyse the evolution of the differences under study. Finally, it would be of interest to consider other previously mentioned elements, such as staff ICT training, to explain the use of ICTs.

References

Alam, K., Ali, M.A., Erdiaw-Kwasie, M.O., Murray, P.A. and Wiesner, R. (2022), "Digital transformation among SMEs: does gender matter?" *Sustainability*, Vol. 14 No. 1, p. 535, doi: 10.3390/su14010535.

Alozie, N.O. and Akpan-Obong, P. (2017), "The digital gender divide: confronting obstacles to women's development in Africa", *Development Policy Review*, Vol. 35 No. 2, pp. 137-160, doi: 10.1111/dpr.12204.

Bendell, B.L., Sullivan, D.M. and Hanek, K.J. (2020), "Gender, technology and decision-making: insights from an experimental conjoint analysis", *International Journal of Entrepreneurial Behavior and Research*, Vol. 26 No. 4, pp. 647-670, doi: 10.1108/IJEBR-04-2019-0232.

Berné, C., García-González, M., García-Uceda, M.E. and Múgica, J.M. (2015), "The effect of ICT on relationship enhancement and performance in tourism channels", *Tourism Management*, Vol. 48, pp. 188-198, doi: 10.1016/j.tourman.2014.04.012.

Best, M.L. and Maier, S. (2007), "Gender, culture and ICT use in rural South India", *Gender, Technology and Development*, Vol. 11 No. 2, pp. 137-155, doi: 10.1177/097185240701100201.

Bhushan, P. (2008), "Connecting or dividing? Examining female learners' information and communication technology access and use in open and distance learning", *Open Learning: The Journal of Open, Distance and e-Learning*, Vol. 23 No. 2, pp. 131-138, doi: 10.1080/02680510802051954.

Blackburn, H. (2017), "The status of women in STEM in higher education: a review of the literature 2007–2017", *Science and Technology Libraries*, Vol. 36 No. 3, pp. 235-273, doi: 10.1080/0194262X.2017.1371658.

Chew, H.E., Edu, C., Student, D. and Levy, M. (2011), "The limited impact of ICTs on microenterprise growth: a study of businesses owned by women in urban India", *Information Technologies and International Development*, Vol. 7 No. 4, pp. 1-16.

Eagly, A.H. (1987), *Sex Differences in Social Behavior*, *Psychology Press*, New York, NY.

Extremadura 2030 (2022), "Análisis DAFO", available at: https://extremadura2030.com/analisis-dafo/ (accessed 16 February 2022).

Fernández-Batanero, J.M., Sañudo, B., Montenegro-Rueda, M. and García-Martínez, I. (2019), "Physical education teachers and their ICT training applied to students with disabilities. The case of Spain", *Sustainability*, Vol. 11 No. 9, p. 2559, doi: 10.3390/su11092559.

Figueroa-Domecq, C., Palomo, J., Flecha-Barrio, M.D. and Segovia-Pérez, M. (2020), "Technology double gender gap in tourism business leadership", *Information Technology and Tourism*, Vol. 22 No. 1, pp. 75-106, doi: 10.1007/s40558-020-00168-0.

González-Pérez, S., Mateos de-Cabo, R. and Sáinz, M. (2020), "Girls in STEM: is it a female role-model thing?" *Frontiers in Psychology*, Vol. 11, p. 2204, doi: 10.3389/fpsyg.2020.02204.

Grande-De Prado, M., Cañón, R., García-Martín, S. and Cantón, I. (2020), "Digital competence and gender: teachers in training. A case study", *Future Internet*, Vol. 12 No. 11, p. 204, doi: 10.3390/fi12110204.

Hetherington, E.M. (1965), "A developmental study of the effects of sex of the dominant parent on sex-role preference, identification, and imitation in children", *Journal of Personality and Social Psychology*, Vol. 2 No. 2, pp. 188-194, doi: 10.1037/h0022374.

Jiyane, V. and Mostert, J. (2010), "Use of information and communication technologies by women hawkers and vendors in South Africa", *African Journal of Library, Archives and Information Science*, Vol. 20 No. 1, pp. 53-61.

Junta de Extremadura (2022), "Extremadura 2030. Estrategia de economía verde y circular", available at: https://extremadura2030.com/analisis-dafo/ (accessed 16 February 2022).

Kusuma, H., Muafi, M., Aji, H.M. and Pamungkas, S. (2020), "Information and communication technology adoption in small- and medium-sized enterprises: demographic characteristics", *The Journal of Asian Finance, Economics and Business*, Vol. 7 No. 10, pp. 969-980, doi: 10.13106/JAFEB.2020.VOL7.NO10.969.

Kwami, J.D. (2015), "Gender, entrepreneurship, and informal markets in Africa: understanding how Ghanaian women traders self-organize with digital tools", in Kwami, J.D. (Ed.), *Comparative Case Studies on Entrepreneurship in Developed and Developing Countries*, IGI Global, PA, pp. 776-805, doi: 10.4018/978-1-4666-7533-9.ch002.

Ma, W., Grafton, R.Q. and Renwick, A. (2020), "Smartphone use and income growth in rural China: empirical results and policy implications", *Electronic Commerce Research*, Vol. 20 No. 4, pp. 713-736, doi: 10.1007/s10660-018-9323-x.

Mack, E.A., Marie-Pierre, L. and Redican, K. (2017), "Entrepreneurs' use of internet and social media applications", *Telecommunications Policy*, Vol. 41 No. 2, pp. 120-139, doi: 10.1016/j.telpol.2016.12.001.

Moreno-Gómez, J., Lafuente, E. and Vaillant, Y. (2018), "Gender diversity in the board, women's leadership and business performance", *Gender in Management: An International Journal*, Vol. 33 No. 2, pp. 104-122, doi: 10.1108/GM-05-2017-0058.

Mulauzi, F. and Albright, K.S. (2009), "Information and communication technologies (ICTs) and development information for professional women in Zambia", *International Journal of Technology Management*, Vol. 45 Nos 1/2, pp. 177-195, doi: 10.1504/IJTM.2009.021527.

Nord, J.H., Riggio, M.T. and Paliszkiewicz, J. (2017), "Social and economic development through information and communications technologies: Italy", *Journal of Computer Information Systems*, Vol. 57 No. 3, pp. 278-285, doi: 10.1080/08874417.2016.1213621.

Novo-Corti, I., Varela-Candamio, L. and García-Álvarez, M.T. (2014), "Breaking the walls of social exclusion of women rural by means of ICTs: the case of 'digital divides' in Galician", *Computers in Human Behavior*, Vol. 30, pp. 497-507, doi: 10.1016/j.chb.2013.06.017.

Olatokun, W.M. (2007), "Availability, accessibility and use of ICTs by Nigerian women academics", *Malaysian Journal of Library and Information Science*, Vol. 12 No. 2, pp. 13-33.

Olsson, A.K. and Bernhard, I. (2021), "Keeping up the pace of digitalization in small businesses–women entrepreneurs' knowledge and use of social media", *International Journal of Entrepreneurial Behavior and Research*, Vol. 27 No. 2, pp. 378-396, doi: 10.1108/IJEBR-10-2019-0615.

Orkoh, E. and Viviers, W. (2021), "Gender composition of ownership and management of firms and the gender digital divide in Africa", *South African Journal of Business Management*, Vol. 52 No. 1, p. 14, doi: 10.4102/sajbm.v52i1.2227.

Ortiz-Colón, A.M., Ágreda-Montoro, M. and Rodríguez-Moreno, J. (2020), "Autopercepción del profesorado de educación primaria en servicio desde el modelo TPACK", *Revista Electrónica Interuniversitaria de Formación Ddel Profesorado*, Vol. 23 No. 2, pp. 53-65, doi: 10.6018/reifop.415641.

Sáinz, M., Meneses, J., López, B.-S. and Fàbregues, S. (2016), "Gender stereotypes and attitudes towards information and communication technology professionals in a sample of Spanish secondary students", *Sex Roles*, Vol. 74 Nos 3/4, pp. 154-168, doi: 10.1007/s11199-014-0424-2.

Sánchez-Prieto, J., Trujillo-Torres, J.M., Gómez-García, M. and Gómez-García, G. (2020), "Gender and digital teaching competence in dual vocational education and training", *Education Sciences*, Vol. 10 No. 3, p. 84, doi: 10.3390/educsci10030084.

Scott, N., Mckemey, K. and Batchelor, S.J. (2004), "The use of telephones amongst the poor in Africa: some gender implications", *Gender, Technology and Development*, Vol. 8 No. 2, pp. 185-207, doi: 10.1080/09718524.2004.11910119.

Seligman, M.E. (1972), "Learned helplessness", *Annual Review of Medicine*, Vol. 23 No. 1, pp. 407-412, doi: 10.1146/annurev.me.23.020172.002203.

Sharafizad, J. (2016), "Women business owners' adoption of information and communication technology", *Journal of Systems and Information Technology*, Vol. 18 No. 4, pp. 331-345, doi: 10.1108/JSIT-07-2016-0048.

Spanish Ministry of Education and Professional Training (2022), "Educabase. Series históricas de estudiantes universitarios desde el curso 1985-1986", Grado y Ciclo. Egresados por tipo y modalidad de la universidad, nivel de estudio, sexo y rama de enseñanza, available at: http://estadisticas.mecd.gob.es/EducaJaxiPx/Tabla.htm?path=/Universitaria/Alumnado/EEU_2022/Serie/GradoCiclo//l0/&file=HIS_Egr_GradCiclo_Rama_CA.px (accessed 22 April 2022).

Ukpere, C.L., Slabbert, A.D. and Ukpere, W.I. (2014), "The relevance of modern technology usage on the business ventures of Kenyan women entrepreneurs", *Mediterranean Journal of Social Sciences*, Vol. 5 No. 10, pp. 58-66, doi: 10.5901/mjss.2014.v5n10p58.

Zeike, S., Bradbury, K., Lindert, L. and Pfaff, H. (2019), "Digital leadership skills and associations with psychological well-being", *International Journal of Environmental Research and Public Health*, Vol. 16 No. 14, p. 2628, doi: 10.3390/ijerph16142628.

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