


Article

# Managerial Digitalisation Cost in the Hotel Sector: The Case of Northern Greece

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**Abstract:** The main purpose of the research is to measure the managerial digitalisation cost of the hotel sector in Northern Greece. Taking into consideration the impact of the pandemic crisis on business management and the lack of rich relevant literature, the study focuses on the cost of managerial digitalisation and its possible relationship with certain hotel demographic characteristics, like star ranking, period of operation, size and accommodation type. The population consists of 2187 hotel units, based on the register of the Hellenic Chamber of Hotels and other local associations such as Chalkidiki Hotels Association. Data were collected through a structured questionnaire, registered in Google forms, and sent by e-mail or alternatively via social media like Facebook. The main finding concerns the low amount of investment related to revenue, as the majority of hotel units spend less than 2.5% of their annual turnover on managerial digitalisation. In addition to this, members of hotel groups, seasonal and summer accommodations invest more in the adoption of digital managerial tools. A positive correlation with the number of employees was also detected. As digitalisation cost in the Greek hospitality sector is a completely unexplored scientific field, this is the first effort to deal with it. Furthermore, as Northern Greece is not as popular a tourist destination as other parts of Greece (i.e., the Aegean islands), the present research is a unique attempt to focus on the hotel sector of a less well-known Greek tourist region.

**Keywords:** E-Management; managerial digitalisation cost; Northern Greece; tourism; hotel sector; hotel demographic characteristics



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## 1. Introduction

In recent years, especially after the coronavirus pandemic, organisations proceeded to a digitalisation of their internal operating models, according to Pateli et al. (2022), Toussaint and Jönsson (2022) and Härting et al. (2022). As Gyürüsi (2018) and O’Leary (2023) mention, digitalisation is the necessary step that precedes digital transformation and is closely related to sustainable growth.

Despite the fact that entering the digital era was recognized as a new hospitality trend before the onset of the recent pandemic (Kundu and Chatterjee 2018), the coronavirus outbreak acted as a catalyst (Boiko et al. 2022), thus accelerating changes. The above statement is confirmed by the vast majority of hotel owners in Portugal, who agreed that COVID-19 promoted the digitalisation of processes, with most organisations considering that online meetings and technology productivity tools are here to stay (Antonio and Rita 2021).

Therefore, the cost of managerial digitalisation of Greek hotels is a key factor that needs to be examined. Especially for the tourism sector, which is particularly affected by the restrictive measures of the pandemic, the cost is an important factor, taking into account the unfavourable financial situation of the corporations. Furthermore, it should be noted that the cost of adopting new technologies in general, and cost–benefit ratios in particular, is a significant inhibiting factor in the digitalisation of German industries (Veile et al. 2019) and SMEs (Zimmermann 2016).

As stated in the literature (O' Leary and Spangler 2018), corporations are replacing, via digitalisation, manual systems with digital approaches and capabilities, in order to provide revenue and create value. As managerial digitalisation, we describe the use of any application that supports administrative operation in hotel units. Apt examples of managerial digitalisation tools mentioned by Pateli et al. (2022) are digital marketing (e.g., social media), dynamic pricing and customer relationship management (CRM) software. Another extension of digitalization concerns the interconnection and data interchange through applications like iCloud (Buhalis and Leung 2018; Antonio and Rita 2021; Zimmermann 2016; Boiko et al. 2022). Another aspect of digitalisation in the hospitality industry which became particularly popular during the pandemic period concerns virtual meetings (Antonio and Rita 2021; Sox et al. 2016). Last but not least, in the context of the use of new technologies in the hotel sector, Alrawadieh et al. (2020) and Demirciftci et al. (2020) deal with revenue management (RM) software in order to increase profitability.

Digitalisation has already affected the industry during the pandemic and there is a strong tendency not to return to the previous state (Antonio and Rita 2021). Furthermore, as stated by Morrone et al. (2021), there is a strong correlation between COVID-19 and the digitalisation of the industry, which leads to increased revenues, reduced costs and improved corporate brands. Therefore, the cost of digitalisation implementation for a hospitality unit is undeniably an important issue. Although there are studies that examine the digitization aspects of hotel units (Pateli et al. 2022; Oliinyk et al. 2022; Antonio and Rita 2021; Alrawadieh et al. 2020; Kansakar et al. 2019), the digitalisation adoption and implementation costs are not taken into consideration. Moreover, the hotel industry in Northern Greece, as it is not a popular tourist destination, is absent from any relevant studies. As a consequence, the present research focuses on these unexplored areas, by evaluating the digitalisation cost of hotel units in the region of Northern Greece.

In light of the above discussion, the key research objectives are twofold. First, we explore the cost of managerial digitalisation in the hospitality sector, since only a limited number of previous studies (Pateli et al. 2022; Alrawadieh et al. 2020) have examined hotel digitalisation from this standpoint internationally. Secondly, we aim at a deep understanding of the role that hotel demographic characteristics play in the extent and cost of digitalisation. Most of the published work (Carlisle et al. 2023; Okafor et al. 2023; Menegaki 2022; Suder et al. 2022) focuses on the role of managers/hotel owners and on the relevance of their personal values and demographic characteristics with the digitalisation of hotels. The present research tries to further extend and complement the existing literature, by highlighting the role of hotel traits in the digitalisation process. As the hospitality sector is characterized by a great diversity (e.g., corporate form, size, star ranking) (Roy and Pyne 2011), certain characteristics were selected, based on the categorisation of the industry in the existing literature. Pateli et al. (2022) link size to accessibility to new technologies, while Zhu and Zhang (2021) use accommodation size as a criterion, focusing on small hospitality businesses. In addition, Alrawadieh et al. (2020) use the corporate form, among other variables, in order to examine the correlation with revenue software implementation. Finally, factors such as accommodation type, star ranking and geographical area were used by Pavlatos and Paggios (2007), in their research regarding costing accounting and the adoption of activity-based costing (A.B.C.) systems in Greek hotels. Consequently, as the hotel industry of Northern Greece has not attracted research interest before, and since the cost of digitizing managerial operations for hotels has not been quantified, this study opens new horizons.

In order to achieve the above aims, the index BUD.BY.REV. (budget as a percentage of total revenue) is used, proposed by Mahmood and Mann (1991), in the context of evaluating the cost of digitalisation in the 2187 registered hotels of the region in question.

The remainder of the paper is organized as follows: Section 2 describes the research methodology, posing the research question; Section 3 presents the findings and the analysis of the results; and Section 4 the discussion of the results. Finally, Section 5 describes the limitations and further research proposals.

## 2. Research Methodology

In an attempt to choose the most appropriate methodology for our research, we examined three schools, which have prevailed in the field of scientific research: (a) the quantitative or positivism; (b) the qualitative, also found as interpretivism; and (c) critical science or postmodernism (Swanson 2005). The perspective of critical science or postmodernism was rejected for our research, as there is no complete and commonly accepted practical guide to implementation (Hallebone and Priest 2009). On the other hand, the qualitative research approach focuses individually on each phenomenon, taking into account the uniqueness that distinguishes it, emphasizing the characteristics associated with uniqueness, aiming to draw conclusions (Kvale 1996). Between the quantitative and qualitative research methodology, the first one was chosen. This choice is connected with the nature of quantitative research (positivism), as it calculates the frequency of observations in order to formulate laws, which are considered objective due to the adoption of statistical tools and the hypothesis that the phenomenon exists unaffected by the researcher (Sprague 2005). In the above decision, the possibility of a fully structured questionnaire and easy identification of the variables were also taken into account.

In the present study, the population consists of all hotel units located in the region of Northern Greece. Through the registrations of the Hellenic Chamber of Hotels, Chalkidiki Hotels Association and Kavala Hoteliers Association, 2187 hotel units were identified, which constitute the population of the survey. A 3.52% response rate is registered. According to the literature, particularly low rates are found in web-based surveys or in cases where the questionnaire is sent by mail (Sivo et al. 2006). Nevertheless, it is noteworthy that this should not be perceived as detrimental to research outcomes. Existing research (Fosnacht et al. 2017) indicates that elevated participation rates, such as 75%, do not necessarily yield more accurate and unbiased population estimates compared to lower rates, such as 5%. Furthermore, the sample could be considered representative, as it includes hotel units of every star category, size and type, from all regions of Northern Greece.

The questionnaire was chosen as the research tool for data collection, as it is regularly used in quantitative research (Brace 2008). A structured online questionnaire with 8 closed-ended questions was drawn up. The choice of closed-ended questions is related to the development of coding schemes, as all expected answers are known in advance (Weisberg et al. 1996). The questionnaire was created electronically through the Google Forms application, while the link was sent via e-mail. The use of an electronic questionnaire in Google Forms was a strategic choice in data collection and analysis, as the data were received classified in an Excel format. In cases where this was not possible, social media such as Facebook, was also used. The questionnaire was sent gradually to each regional unit from February to April 2023.

The statistical analysis of collected data was conducted with the support of the Statistical Package for the Social Sciences application (S.P.S.S.).

The research hypothesis put forward for evaluation is the following:

**H<sub>0</sub>.** *The investment in managerial digitalisation of the hotel industry in Northern Greece is related to specific demographic characteristics.*

By the term investment in managerial digitalisation, in this research, the gross investment is considered. To be more specific, the initial total amount of investment is taken into account, before the deduction of depreciation (Harris and Roach 2018).

There are 8 variables considered, in order to evaluate the relationships of the research hypothesis. More specifically, through statistical analysis, it was examined whether the 7 independent variables affect the dependent variable (David and Sutton 2004). The managerial digitalisation cost of hotel units was defined as the dependent variable (Y), while the demographic factors of hotel units were used as the independent variables (X) (Appendix A).

As shown in Table 1 below, the independent variables (X) include hotel classification criteria, and more specifically star rating (Sufi 2019), corporate form (Cunill 2003), number

of employees and annual turnover as size characteristics (European Commission 2019), seasonality (Leslie 2012), type of accommodation (Inskeep 1991) and region of activity (Page 2003).

**Table 1.** Independent variables.

Independent Variable	Reference	
Star Rating	Sufi (2019)	X <sub>1</sub>
Corporate form	Cunill (2003)	X <sub>2</sub>
Number of employees in 2022	European Commission (2019)	X <sub>3</sub>
Annual turnover in 2022	European Commission (2019)	X <sub>4</sub>
Operating period	Leslie (2012)	X <sub>5</sub>
Accommodation type	Inskeep (1991)	X <sub>6</sub>
Region	Page (2003)	X <sub>7</sub>

As the amount of investment in managerial digitalisation is quite possible to be related to the size and financial resources of each corporation, an indicator was chosen as the dependent variable (Y), instead of a monetary amount. In particular, the index *BUD.BY.REV.* (budget as a percentage of total revenue) was chosen, which presents investment as a percentage of annual turnover (Mahmood and Mann 1991). Furthermore, the base price was set at 2.5%, according to Starkov (2022).

### 3. Analysis of Results

As shown in Table 2, 61 hotels of the sample (79.2%) operate in Central Macedonia, 14 (18.2%) in Eastern Macedonia and Thrace and 2 (2.6%) in Western Macedonia. Regarding star ranking, 36.4% (n = 28) of hotel units were in the category 3\*, 22.1% (n = 17) were in the category 4\* and 16.9% (n = 13) were in the category 5\*. Accordingly, 16.9% (n = 13) were in the category 2\* and 7.8 (n = 6) in the category 1\*. As for the corporation form, 89.6% (n = 69) of hotels were operating independently and 10.4% (n = 8) were members of a hotel group.

**Table 2.** Sample demographics.

		(n)	%
Star ranking	*	6	7.8%
	**	13	16.9%
	***	28	36.4%
	****	17	22.1%
	*****	13	16.9%
Corporate form	Member of hotel chain	8	10.4%
	Independent hotel	69	89.6%
Number of employees in 2022	≤10	36	46.8%
	11–50	27	35.1%
	51–250	11	14.3%
	≥251	3	3.9%
Annual turnover in 2022 (in EUR)	≤2000.000	57	74.0%
	2,000,001–10,000,000	12	15.6%
	10,000,001–50,000,000	3	3.9%
	≥50,000,001	5	6.5%
Operating period	Twelve months	40	51.9%
	Seasonal	37	48.1%
Accommodation type	Summer	42	54.5%
	Urban	24	31.2%
	Winter	4	5.2%
	Other (e.g., motel)	7	9.1%
Regional unit	Central Macedonia	61	79.2%
	Eastern Macedonia and Thrace	14	18.2%
	Western Macedonia	2	2.6%

Furthermore, 46.8% of the sample employed less than 10 workers during 2022 and 35.1% had between 11 and 50 employees. A smaller percentage of hotel units reported 51 to 250 employees (14.3%) or more than 250 employees (3.9%). Regarding the annual income, the results showed that 74% of them had a turnover of less than EUR 2 million, 15.6% counted a turnover of EUR 2 to 10 million and 10.4% had an income of over EUR 10 million. The majority of the sample operated continuously (twelve-month period) ( $n = 40$ , 51.9%), while 54.5% ( $n = 42$ ) were summer accommodations. A smaller percentage of hotel units had a seasonal operation ( $n = 37$ , 48.1%), 31.2% were characterized as urban ( $n = 24$ ), 5.2% as winter ( $n = 4$ ) and 9.1% as other types of accommodation ( $n = 7$ ). Taking into account the European Union categorisation for small and medium-sized enterprises (SMEs) (European Commission 2019), 33 hotel enterprises are categorised as very small, 26 as small, 12 as medium sized and only 6 as large entities.

Table 3 presents statistics regarding the percentage of hotel units' investment in the implementation of digital managerial tools. The results show that 36.4% of hotels have invested in the implementation of digital management tools at a rate of less than 1.25%, while 46.8% have invested in the implementation of digital management tools at a rate between 1.25% and 2.5%. A significantly smaller percentage of hotel units have invested in the implementation of digital management tools at a rate between 2.51% and 3.75% and at a rate above 3.75%.

**Table 3.** Investment in the adoption of managerial digitalisation tools.

	n	%	
Percentage of hotel unit's investment in implementing digital managerial tools	Less than 1.25%	28	36.4%
	From 1.25% to 2.5%	36	46.8%
	From 2.51% to 3.75%	9	11.7%
	Above 3.75%	4	5.2%

The findings regarding the relationship between the investment rate of hotels in the adoption of digital managerial tools and their demographic characteristics (star rating, corporate form, number of employees, annual turnover, seasonality, type of accommodation and region of operation) are presented below. In order to investigate the relationship between the investment rate and demographic characteristics, the  $\chi^2$  independence test is used. Table 4 shows that the investment percentage of hotel units in the application of digital managerial tools depends, to a statistically significant extent, on the following:

- i. The corporation form ( $\chi^2(3) = 9272$ ,  $p = 0.026$ );
- ii. The number of employees ( $\chi^2(9) = 28,105$ ,  $p = 0.001$ );
- iii. The period of operation ( $\chi^2(3) = 8738$ ,  $p = 0.033$ );
- iv. The type of accommodation ( $\chi^2(9) = 19,688$ ,  $p = 0.020$ ).

**Table 4.** Investment in managerial digitalisation and corporate form.

		Budget as a Percentage of Total Revenue				$\chi^2$	$p$
		<1.25%	1.25–2.5%	2.51–3.75%	>3.75%		
<b>Corporate form</b>						9.272	0.026 *
Member of a chain.	n	0	5	3	0		
	%	0.0%	62.5%	37.5%	0.0%		
Independent unit.	n	28	31	6	4		
	%	40.6%	44.9%	8.7%	5.8%		

\* The probability ( $p$ -value) is less than the predetermined significance level (0.05 or 5%), indicating a statistically significant finding.

The above results from the relationship between the BUD.BY.REV. index and hotels' corporate form show that from the total of hotels being members of a chain, 62.5% invest in the adoption of digital managerial tools between 1.25% and 2.5% of their total revenue,

while 37.5% invest between 2.51% and 3.75%. Accordingly, regarding independent hotels, 40.6% invest in the application of digital management tools less than 1.25% of their budget, 44.9% invest from 1.25% to 2.5%, 8.7% invest between 2.51% and 3.75% and 5.8% invest more than 3.75% of their total revenue. It is obvious from the above that members of hotel groups are expected to invest higher proportional amounts in their administrative digitalisation compared to independent hotel units. This finding confirms the findings of [Alrawadieh et al. \(2020\)](#), who argue that members of hotel groups are more responsive to costs and have fewer restrictions on digital transformation than independent hotel units.

As far as the relationship between the investment rate and the number of employees, the following Table 5 presents the relevant results.

**Table 5.** Investment in managerial digitalisation and staff number.

		Budget as a Percentage of Total Revenue				$\chi^2$	<i>p</i>
		<1.25%	1.25–2.5%	2.51–3.75%	>3.75%		
<b>Number of employees in 2022</b>						28.105	0.001 *
≤10	n	19	11	3	3		
	%	52.8%	30.6%	8.3%	8.3%		
11–50	n	7	18	2	0		
	%	25.9%	66.7%	7.4%	0.0%		
51–250	n	2	7	2	0		
	%	18.2%	63.6%	18.2%	0.0%		
≥251	n	0	0	2	1		
	%	0.0%	0.0%	66.7%	33.3%		

\* The probability (*p*-value) is less than the predetermined significance level (0.05 or 5%), indicating a statistically significant finding.

The relationship between the BUD.BY.REV. index and the number of employees shows that 52.8% of hotel units with up to 10 employees invest less than 1.5% of their total revenue, 30.6% invest between 1.25% and 2.5%, 8.3% invest between 2.51% and 3.75% and 8.3% invest more than 3.75% of their revenue. Furthermore, 25.9% of hotels with 11 to 50 employees invest less than 1.25%, 66.7% invest from 1.25% to 2.5% and 7.4% invest from 2.51% to 3.75%. In addition, 18.2% of hotel units that have 51 to 250 employees invest less than 1.25%, 63.6% invest between 1.25% and 2.5% and 18.2% invest from 2.51% to 3.75%. Finally, 66.7% of hotels with more than 250 workers invest between 2.51% and 3.75% of their total revenue, while 33.3% invest more than 3.75%. These results show that there is a positive correlation between the investment rate and staff number, while hotel units with more than 250 employees are more likely to invest a greater percentage in the implementation of digital managerial tools. The above confirms the conclusion of [Pateli et al. \(2022\)](#), who argue that corporate size is positively related to accessibility to new technologies.

The relationship between the investment rate and the operating period of the hotels is presented in Table 6.

**Table 6.** Investment in managerial digitalisation and period of operation.

		Budget as a Percentage of Total Revenue				$\chi^2$	<i>p</i>
		<1.25%	1.25–2.5%	2.51–3.75%	>3.75%		
<b>Operating period</b>						8.738	0.033 *
Seasonal	n	10	19	8	3		
	%	25.0%	47.5%	20.0%	7.5%		
Twelve months	n	18	17	1	1		
	%	48.6%	45.9%	2.7%	2.7%		

\* The probability (*p*-value) is less than the predetermined significance level (0.05 or 5%), indicating a statistically significant finding.

The above results show that 25% of seasonal hotels invest up to 1.25% of their total revenue, 47.5% invest between 1.25% and 2.5%, 20% invest between 2.51% and 3.75% and only 7.5% invest more than 3.75%. Accordingly, 48.6% of hotels with continuous operation invest less than 1.25%, 45.9% invest from 1.25% to 2.5%, 2.7% invest from 2.51% to 3.75%, while 2.7% invest more than 3.75%. The above findings show that seasonal hotels are more likely to invest a greater percentage in managerial digitalisation than twelve-month hotel units. This finding is consistent with Naumik-Gladka et al. (2023), arguing that seasonal staffing is associated with a higher use of information and communication technologies (I.C.T.).

Finally, the relationship between the investment rate and the accommodation type of the hotel units is presented in Table 7.

**Table 7.** Investment in managerial digitalisation and type of accommodation.

Accommodation type		Budget as a Percentage of Total Revenue				$\chi^2$	<i>p</i>
		<1.25%	1.25–2.5%	2.51–3.75%	>3.75%		
						19.688	0.020 *
Summer	n	11	20	8	3		
	%	26.2%	47.6%	19.0%	7.1%		
Urban	n	9	14	1	0		
	%	37.5%	58.3%	4.2%	0.0%		
Winter	n	4	0	0	0		
	%	100.0%	0.0%	0.0%	0.0%		
Other	n	4	2	0	1		
	%	57.1%	28.6%	0.0%	14.3%		

\* The probability (*p*-value) is less than the predetermined significance level (0.05 or 5%), indicating a statistically significant finding.

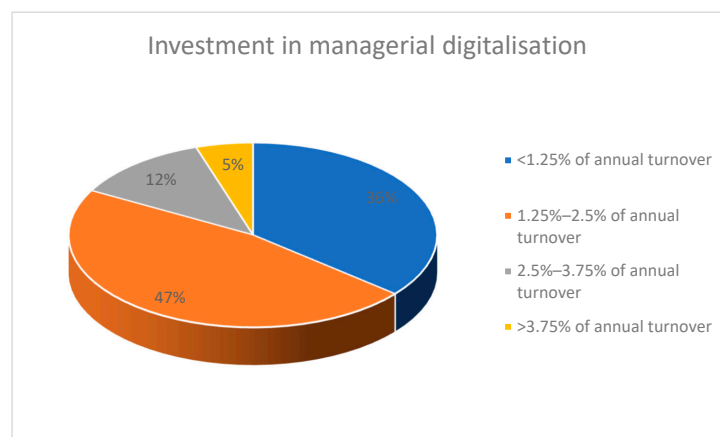
The results show that 26.2% of summer accommodations invest up to 1.25%, 47.6% invest between 1.25% and 2.5%, 19% invest from 2.51% to 3.75% and 7.1% invest above 3.75% of their total revenue. Accordingly, 37.5% of urban hotels invest less than 1.25% and 58.3% invest between 1.25% and 2.5%, while 4.2% invest from between 2.51% and 3.75%. Furthermore, all winter resorts (100%) invest less than 1.25% in the adoption of digital managerial tools. Finally, as far as other uncategorised hotels are concerned (e.g., motels), 57.1% invest up to 1.25%, 28.6% invest between 1.25% and 2.5% and only 14.3% invest more than 3.75%. These results show that summer resorts and other type of hotel units are more likely to invest a greater percentage in managerial digitalisation compared to urban and winter hotel units.

#### 4. Discussion

This study contributes to the growing literature surrounding digitalisation in the hospitality sector, by highlighting digitalization costs and their relevance with certain hotel demographic characteristics. This is a significant contribution to the literature, given that there are a limited number of published papers that focus on the role of hotel traits rather than the personal demographic characteristics of managers and/or hotel owners.

From the statistical analysis of the sample, it emerged that the amount of investment in managerial digitalisation depends on the hotels' corporate form (independent, member of a group, franchisee), on the number of employees, on the seasonality and on the type of accommodation (summer, urban, winter, other). In particular, the following conclusions emerged regarding managerial digitalisation cost and the factors affecting it.

First of all, as shown in Figure 1, it is obvious that the 'lion's share' of the sample, almost 83%, invest less than 2.5% of their annual turnover in new technologies, which is smaller than the percentage that Starkov reports (2022), while only 17% of the hotels spend more than 2.5% of their turnover on managerial digitalisation.



**Figure 1.** Investment in managerial digitalisation by annual turnover.

In relation to the factors that affect the investment in managerial digitalisation, the following stand out:

#### Corporate form

As shown in Table 4, it has been found that a member of a hotel group is more likely to invest a higher percentage of income in managerial digitalisation than independent hotel units and members of a franchise chain, ( $p = 0.026 < 0.05$ ), which is in line with the work of [Yavuz and Mesci \(2021\)](#) and [Alrawadieh et al. \(2020\)](#). It is suggested that this finding is connected with the broader strategy of the hotel group and the more complex management and control process. Being an international hotel chain has advantages, and thus they can implement new systems more easily.

#### Firm size (Number of employees—Annual turnover)

A positive correlation was observed in Table 5 between the number of employees and the investment in managerial digitalisation ( $p = 0.001 < 0.05$ ). On the other hand, there was a marginal rejection of the hypothesis regarding annual turnovers ( $p = 0.059 > 0.05$ ). More specifically, according to the findings presented in Appendix A, although a positive correlation was found between the dependent (BUD.BY.REV. ratio) and an independent variable (annual turnover in 2022), it was considered borderline not statistically significant. Such a correlation, combined with the already identified positive relationship with the number of employees, establishes a hypothesis that the investment in managerial digitalisation is positively associated with the size of a firm, which is consistent with the findings of [Jaumotte et al. \(2023\)](#) and [Pateli et al. \(2022\)](#). The relationship between size and digitalisation has already been reported in other research ([Raimo et al. 2022](#); [Zimmermann 2018](#)). [Pyroh et al. \(2021\)](#) highlight the significant gap between large companies and small and medium-sized enterprises, which exists not only for advanced technologies but also for basic digital solutions.

#### Seasonality

As pictured in Table 6, our research verifies that there is a correlation between seasonality and the cost of digitalisation in the hotel sector. It shows that hotel units that operate seasonally seem more likely to invest higher amounts in managerial digitalisation compared to 12-month operating hotels ( $p = 0.033 < 0.05$ ). This finding, however, is not supported by the work of [Ivanovic et al. \(2022\)](#), who state that hotel companies with seasonal operations find it difficult to obtain the necessary financial resources on the capital market for current and investment operations; there is a low return on investment and a low level of resource utilization in the hotel industry. As a consequence, further evaluation of this variable in a different or larger sample is considered valuable. From there on, as the selected index takes into account the annual income, it is necessary to examine the seasonality in the turnover and by extension in the BUD.BY.REV. ratio. At this point, it



should be mentioned that any correlation between turnover and the index for all hotels has already been rejected by the analysis of current data. Consequently, the effect of seasonality on turnover could not affect the level of the index. In addition to the above, the demographic data of the research shows that the only five hotels in the sample with a turnover greater than EUR 50,000,000 are seasonal and only two of them invest in digitalisation at less than 1.25% of their revenues. Furthermore, for an annual income between EUR 10,000,000–50,000,000, there are three hotel units, two of twelve-month operation and one seasonal. The seasonal is the only one which registers an index greater than 3.75%, while the ones of twelve-month operation invest between 1.25 and 2.5% of their revenues. This fact is probably due to some degree of variability in digitalisation costs, a hypothesis which needs to be further examined.

#### Type of accommodation

Summer accommodations and other similar hotel types invest more in the adoption of digital managerial tools than winter resorts and urban hotels, according to the statistics in Table 7 ( $p = 0.020 < 0.05$ ). This correlation is an absolutely interesting finding, due to the unexpected differentiation between winter and summer type hotels, and needs to be further investigated.

#### Star rating–Regional unit

No correlation was found between the percentage of investment in managerial digitalisation and two independent variables, star rating ( $p = 0.312 > 0.05$ ) and regional unit ( $p = 0.419 > 0.05$ ). Relevant tables can be found in Appendix A. Accordingly, the relevant hypotheses were dismissed.

### 5. Limitations—Further Research

In spite of the existence of statistically significant correlations and the literature confirming that higher response rates do not provide unbiased population estimates, as mentioned earlier, the low response rate is undoubtedly a research limitation. A greater sample could increase the reliability level. It should also be noted that, although quite scarce, hotels with no internet presence like a website, e-mail or social media account were not included in the population of the study, since they could not receive the survey link and thus participate in the survey. Finally, no universally accepted protocol or standard exists regarding the digitalisation of corporations, in order for researchers to compare costs with a specific level of digitalisation. As long as there is no valid measure, digitalisation remains a more general concept, making the cost comparison process slightly vague.

The application of the present research to a less famous region of the Greek hospitality sector, such as Northern Greece, is certainly an interesting challenge, which could be expanded with further research in more popular tourist destinations, like Crete or the Aegean islands. This expanded survey could provide useful findings in the form of comparisons or the identification of similarities and differences among various (touristically popular vs. unpopular) Greek regions. In addition to the above, the same methodology with corresponding adjustments could be implemented in other service sectors of the Greek economy, such as transportation or food and beverages.

Furthermore, sustainability could be one more particularly interesting area of future research. More specifically, the correlation of sustainable corporate growth with managerial and operational digitalisation is proposed.

Finally, addressing the issue of managerial digitalisation from a broader point of view could form a beneficial perspective. In particular, the total cost of ownership could be a significant factor that could enrich future research, taking into account not only the initial investment but also various operating costs.

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## Appendix A

**Table A1.** Statistical findings follow just below.

		Budget as a Percentage of Total Revenue				$\chi^2$	<i>p</i>
		<1.25%	1.25–2.5%	2.51–3.75%	>3.75%		
Star ranking						13.803	0.312
	n	2	2	1	1		
*	%	33.3%	33.3%	16.7%	16.7%		
	n	6	7	0	0		
**	%	46.2%	53.8%	0.0%	0.0%		
	n	13	11	2	2		
***	%	46.4%	39.3%	7.1%	7.1%		
	n	5	10	2	0		
****	%	29.4%	58.8%	11.8%	0.0%		
	n	2	6	4	1		
*****	%	15.4%	46.2%	30.8%	7.7%		
Corporate form						9.272	0.026 *
	n	0	5	3	0		
Member of a chain	%	0.0%	62.5%	37.5%	0.0%		
	n	28	31	6	4		
Independent unit	%	40.6%	44.9%	8.7%	5.8%		
Number of employees in 2022						28.105	0.001 *
	n	19	11	3	3		
≤10	%	52.8%	30.6%	8.3%	8.3%		
	n	7	18	2	0		
11–50	%	25.9%	66.7%	7.4%	0.0%		
	n	2	7	2	0		
51–250	%	18.2%	63.6%	18.2%	0.0%		
	n	0	0	2	1		
≥251	%	0.0%	0.0%	66.7%	33.3%		
Annual turnover in 2022 (in million €)						16.405	0.059
	n	24	26	4	3		
≤2	%	42.1%	45.6%	7.0%	5.3%		
	n	2	7	3	0		
2–10	%	16.7%	58.3%	25.0%	0.0%		
	n	0	2	0	1		
10–50	%	0.0%	66.7%	0.0%	33.3%		
	n	2	1	2	0		
>50	%	40.0%	20.0%	40.0%	0.0%		
Operating period						8.738	0.033*
	n	10	19	8	3		
Seasonal	%	25.0%	47.5%	20.0%	7.5%		
	n	18	17	1	1		
Twelve months	%	48.6%	45.9%	2.7%	2.7%		
Accommodation type						19.688	0.020 *
	n	11	20	8	3		
Summer	%	26.2%	47.6%	19.0%	7.1%		
	n	9	14	1	0		
Urban	%	37.5%	58.3%	4.2%	0.0%		
	n	4	0	0	0		
Winter	%	100.0%	0.0%	0.0%	0.0%		
	n	4	2	0	1		
Other	%	57.1%	28.6%	0.0%	14.3%		
Regional unit						6.036	0.419
	n	22	27	8	4		
A	%	36.1%	44.3%	13.1%	6.6%		
	n	4	9	1	0		
B	%	28.6%	64.3%	7.1%	0.0%		
	n	2	0	0	0		
C	%	100%	0.0%	0.0%	0.0%		

A = Central Macedonia, B = Eastern Macedonia and Thrace, C = Western Macedonia. \* The probability (*p*-value) is less than the predetermined significance level (0.05 or 5%), indicating a statistically significant finding.

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