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Sustainability in the Italian hotel infrastructure: is it a priority for decision-makers?

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ABSTRACT

This article investigates the sustainability in the Italian hospitality sector and the reasons why its infrastructure lacks on energetic and thermal efficiency despite the numerous solutions present in the market. The study is performed based on bibliographical research and a survey conducted with hotel managers and hotel real estate owners. It draws compelling conclusions about the main drivers to innovation and restructuring in the sector.

Keywords: Hospitality, sustainability, innovation, decision making.

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INTRODUCTION

The Italian hospitality infrastructure is characterised by a distributed set of structures of small-medium size - with an average of 70 rooms (ITP, 2017) - and relatively old construction date - 80% of the building has been constructed before 1980 (Belicini et al., 2010).

Italy is far behind the average in terms of hotel chains and big corporations' impact in their receptive portfolio, with these hotels corresponding to 5% of the total offer, against an average of 10% of other European countries (ENEA, 2016). The sector is composed mainly of a family running business, which makes up to 95% of the total offer (UNWTO, 2019).

The above-mentioned features combined are a drive for an important phenomenon in terms of energetic and structural sustainability. Hotels in Italy contribute more than any other kind of building to electric energy consumption and are the second most impactful typology when heating usage is considered.

Possible motivations to these facts are:

- (i) The outdated standards followed during the construction of the structures;
- (ii) Continuous lack of investments in restructuring and renovation driven by a low investment capacity of small business.

According to the Global Risks Report (World Economic Forum, 2019) the sector would have to decrease its carbon footprint in 66% until 2030 and 90% until 2050 in order to comply with the expected target of

the Paris agreement signed in 2016. An ambitious objective is posed to the sector, and to achieve such a result, the owners and managers should make a continuous and significant effort of the hospitality structure.

This paper's goal is to understand the current scenario of the sector from two points of view:

- (iii) How well developed and effective are the current solutions available on the market;
- (iv) How aware and how motivated are the decision-makers on the sector when it comes to achieving the desired sustainability levels.

Beyond assessing the current status of the sector, this paper also gives some insights into the application of innovation processes to foster the creation of new impactful ideas and solutions.

It is necessary to highlight an essential factor of the research: The surveys and interviews performed with decision-makers were held at the beginning of 2020, also during this period the COVID-19 outbreak was building up to the total lockdown in Italian territory. Such an event had immediate and profound consequences to the hospitality sector, not only blocking the normal operations but also changing the short- and medium-term plans for businesses.

In terms of academic interest, the authors consider this factor as both negative - because it creates a disturbance in the methodology - and positive - since it strains the sector and forces the stakeholders to rethink their priorities and set their vision to tactical and strategic decisions to come out of the emergency.



THEORETICAL BACKGROUND

When looking at sustainability, from the triple bottom line perspective (economic, social, and environmental), and through project managers' lens is possible to notice that decisions are taken according to four main factors: Sustainable Innovation Business Model, Stakeholders Management, Economic and Competitive Advantage, and Environmental Policies and Resources Saving (Martens et al., 2017).

The success of these decisions is determined by the ability of the management to commit, communicate, promote and implement the principles of sustainability (Klettner et al., 2014).

Despite the common belief that sustainability should be part of the decision-making processes in many organizations, Daily and Huang (2001) have shown that there is currently a lack of clarity as to how organizations implement sustainability initiatives into their business processes.

For example, in the public hospital sector has been shown the lack of evaluations in respect of the achievement of the sustainability initiatives put in place (Rodriguez et al., 2020).

Regarding our sector of interest, green innovation has been proven an enabler for policy makers and hotel managers to reach sustainability (Asadi et al., 2020). Moreover, (Kularatne et al., 2019) have shown that environmentally sustainable practices provide hotel operators with a competitive advantage which can assist them with strategic decision making.

The scenario, however, isn't simple to access in terms of effective results. As shown by (Kim 2018) the correlation between pro-environmental actions and effective outcomes in terms of environmental performance is not direct and depends on the typology of action undertaken: reactive corporate environmental practice is associated with worse environmental performance.

This complex interdependency is not surprising, since many underlying factors play a role in the problem. One curious example of how wide and unpredictable the road to green tourism can be is (Cui et al. 2020), where the authors present a correlation between customer tendency to choose eco-friendly hotels and their current state of physical cleansing, due to moral issues.

In the field of psychology, many studies have been performed to analyse the pro-environmental behaviour in the individual level as shown by (Banwo and Du, 2019) and a complete literature review in (Li et al. 2019).

But as highlighted by (Aguado and Holl, 2018), there is no closed model to predict the level of corporate environmental responsibility. Some good predictors might be its size (the bigger the higher the probability of going beyond the minimum actions required by regulation), how sensible it is to the market pressures, and cross-cultural factors. In (Tatoglu et al. 2019) the authors conclude that as companies turn out to be more

customer focused, more inclined to pursue a differentiation strategy and subject to a higher level of strategy-oriented stakeholder focus, they tend to implement higher levels of Voluntary Environmental Management practices. This landscape, unfortunately, differs significantly of the average profile of the hospitality sector in Italy.

A different view on the problem could also consider the findings of behavioural economics, that granted Daniel Kahneman the Nobel-Prize in Economics and are summarized in (Kahneman, 2013). The understanding that humans (or in this case travellers and decision makers in the hospitality industry) are subjected to various biases and not always follow the most rational path towards their own benefit can give an interesting dimension to answer the questions posed in the paper.

Works as (Nisa, 2017) give a hint of how to deal with the problem in a systematic approach, considering the inherent behaviour of guests.

Barrier found in the literature

The barrier addressed by the literature is the lack of a globally recognized certification, there are some certifications like the Building Research Establishment Environmental Assessment Method (BREEAM) and the Leadership in Energy and Environmental Design (LEED) which cover the building aspects but are not tailored for hospitality thus missing critical parts of the hotel infrastructure like its services (Baldwin, 1994; Humbert et al., 2007).

In general, businesses in the hospitality field focus on year-over-year results while environmental sustainability and possibly, a decarbonized industry, requires a strategic plan of several decades given the long lifetime of the buildings (Wu et al., 2018). The main goal for the stakeholders is profitability so they are willing to satisfy the increasing consumer demand towards sustainability, but at the minimum cost (Williams and Dair, 2007).

SOLUTIONS AVAILABLE ON THE MARKET

This session aims to give a broad view of the current state and possible solutions on the market when energetic and structural solutions are concerned.

Energy efficiency solutions

Many technical solutions are currently available in the market to improve the level of efficiency and reduce the carbon emission in buildings (Cassa Depositi e Prestiti S.p.A., 2019). Among them:

- (v) **Thermal insulation (winter):** aerogel, vacuum panels, thermo-plaster;

- (vi) **Summers's solutions:** PCM (Phase Change Materials), endothermic membranes, Cool Materials
- (vii) **Window glasses:** reduced solar factor, high thermal insulation, transparent with a warm edge (warm edge), multi-chamber PVC frames, multi-chamber thermal break aluminium frames, low-density wooden frames, double glazing, thermal insulation of the box.
- (viii) **Shielding structures:** Vertical/horizontal and fixed/adjustable sunscreens, Rolling blinds.
- (ix) **Systems for the integrated management of the building's technological functions:** BMS / BACS (Building Management System / Building Automation and Control System) control systems specifically dedicated to the energy systems present in the building allow to optimise the performance of the building system- system in operation, ensuring comfort and air quality conditions inside the built environment.
- (x) **Green Roof e Vertical Greenery System:** plant systems associated with flat and oblique structures. The vegetation together with the substrate that supports it increases resistance and thermal inertia and allows to maintain surface temperatures lower than external temperatures thanks to the phenomenon of evapotranspiration, especially in the summer season.
- (xi) **Data and BIM software:** virtual container capable of storing all information on the architectural project. The product specifications used, logistics, work sequences to be carried out for the construction and on the costs relating to the development, management and maintenance of the artefact.
- (xii) **Pre-casting:** pre-casting components, and of components explicitly made for the project, simplifies the construction site and reduces the need for labour on the place where it is much less effective.
- (xiii) **Business and product life cycle:** facility management systems start to be connected directly to the BIM models, for the best possible uses. The BIM-facility management integration is influencing the correct use of BIM for professionals: this process can produce significant benefits in terms of operating costs.
- (xiv) **The industrialisation of the offer for micro-demand:** industrial offer by integrating services and products thanks to new technologies for small redevelopment activities (current maintenance, limited renovations, energy efficiency).

METHOD AND DATA

Once the technical scenario is well established, the question that shall be answered are:

- Do decision-makers see sustainability as an important goal?
- Are decision-makers (or at least have the impression of being) investing enough in sustainable solutions?
- What are the perceived benefits of such investments?
- What are the most significant barriers preventing further investments in sustainability?

A two-prong approach has been developed to investigate the issue: an online survey sent to a large pool of hotel owners and managers; and one-to-one interviews. The former has the main advantage to bring more standardised and numerous data with lower effort. At the same time, the latter allows for more open answers and is essential to gain insights and avoid biases.

The formulation of the survey took place through several virtual team meetings. The twelve questions were calibrated to receive information regarding the behaviour of operators in the Italian hotel sector concerning issues of environmental sustainability and structural maintenance.

The survey first required the financial investment areas of the hotels to trace the fields of interest of the decision-makers in the hospitality sector (Q1, Q2, Q3, Q4). In particular, the first question was asked about the size of the structure and the number of rooms. Questions 2, 3 and 4 focused on income, expenses, the state of conservation of the structure and the incidence of energy consumption on revenues in hotel management. These first questions were essential to trace the interviewee's profile.

After the general business questions, the survey continues specifically to test the interest in the areas of energy efficiency and structural maintenance (Q5, Q6, Q7). Questions 5, 6 and 7 concerned the percentage of the budget invested in marketing, renovation and energy efficiency respectively. These three questions frame the scope of investments in the three sectors and allow us to outline the specific financial interests of the respondents.

The following three questions aimed to understand what the respondents' position was on environmental sustainability (Q8, Q9, Q10). The first asks what the initiatives that the interviewee has carried out in the field of sustainability are. Question 9, on the other hand, concerned the main obstacles to environmental sustainability initiatives. Question 10 has constructed scenarios of possible improvements in the hospitality sector through the use of environmentally sustainable initiatives. These three questions had the option of multiple selections of answers to leave respondents free to choose more than one option.

The last two questions focused on the respondents' future choices (Q11, Q12). In particular, question 11 aims to understand what are the initiatives that, according to the interviewee, make the hotel infrastructure more sustainable both from a structural and energy point of view. The last multiple-choice question was about the choice of environmental sustainability initiatives to be implemented in the hotel structure of the interviewee.

The personal interviews were held in a more loosely controlled environment to encourage the interviewee to enlarge the scope of the discussion and bring their own experiences and opinions to the fullest potential.

In total, ten interviews were performed with hotel managers/owners, technical managers, hotel staff and important stakeholders.

The survey questions were the basis of the interviews. Each interview was conducted through virtual meetings, due to the global COVID-19 pandemic.

RESULTS

The survey had a total number of respondents equal to 22. Their results and main insights are described below, and the referenced tables are placed in the Appendix, for sake of brevity.

In Table 2, it is possible to notice that the number of hotels with high occupation rate (over 75%) is low, which indicates a less efficient business model and possibly a lower investment capacity.

Quite interestingly, when inquired about sustainable initiatives (Table 3), most of the hotels have invested in at least one kind of solution. It is also very clear that initiatives with higher investment levels (material changes and energy qualification) related to the infrastructure were less common than simple and more operative measures as recycling or plastic reduction.

The answers shown in table 4 highlight a clear sign about barriers: decision-makers are aware of the usefulness of sustainable investments but suffer from the economic burden and the complexity to implement them.

Another clear sign from the decision-makers is visible in Table 5: there are several benefits related to sustainability. However, it is not a decisive factor to the customer and therefore will not bring more clients to the structure. This point of view was also confirmed during the personal interviews, where managers affirmed that investments are more likely to be done for improvements that have tangible benefits on revenues (more clients or higher room price) in detriment to projects with long-term cost benefits.

Finally, in Table 6, it is confirmed the willingness of decision-makers on adopting new solutions, in particular the use of renewables (in the form of photovoltaic panels) is interesting to notice.

Performing a cross-tabulation analysis between the answers of Question 4 (How much do energy

consumption impact your earnings?) and Question 7 (What percentage of the budget is invested on energy efficiency?) it is possible to draw some interesting conclusions about the reasoning among decision makers.

One should expect that respondents claiming that energy consumption has a high impact on their earnings would be more prone to invest on energy efficiency, thus considering the null hypothesis be that the answers to Q4 and Q7 are independent a chi-square evaluation of these answers is performed.

The answers to each question are segmented in three groups: low (from 1 to 4), medium (from 5 to 7) and high (from 8 to 10) on the scale of importance. To deny the null hypothesis a significance level of 0.05 is established.

Q4 Answers	Q7 Answers			Sub Total
	Low	Medium	High	
Low	3	2	1	6
Expected Value	3.5	1.4	1.1	
Chi-square	0.08	0.30	0.01	
Medium	6	2	2	10
Expected Value	5.9	2.3	1.8	
Chi-square	0.00	0.03	0.02	
High	4	1	1	6
Expected Value	3.5	1.4	1.1	
Chi-square	0.06	0.10	0.01	
Sub Total	13	5	4	22
Expected %	59%	23%	18%	

Cumulative Chi-Square	0.60
Degrees of Freedom	4
P-Value	0.11

Fig. 1 – Chi-square correlation test between answers of Question 4 and Question 7 of the survey

Since the P-value (0.11) is higher than the significance level (0.05), we must accept the null hypothesis.

Thus, we conclude that there is no relationship between the answers, the exact opposite result one should expect from perfectly logic decision making process.

DISCUSSION AND CONCLUSIONS

Despite the environmental concern well stated by the Paris agreement signed in 2016, the Italian hospitality sector seems far from embarking into a sustainable journey. According to the presented report, the difficulties in lowering the footprint of the infrastructures are not due to the lack of innovation in the sector since many technologies are present and are under investigation. The real challenge is faced by the key players of the sector: the decision-makers. They are not motivated in environmental investments due to a quite high break-even time, high level of investments, the low tangibility of outcomes, and low impact on revenues.

This scenario, and the solutions available on the market, make very little room for start-ups or innovators

to address Sustainable Development Goals for the hospitality sector, at least with the current methods.

The most promising road for innovation would be the adoption of sustainable solutions that resonate with the immediate and tangible results expected by decision makers, or that can be communicated more effectively in terms of real advantages.

As initially suggested by the correlation analysis, not always the investments are put on the subjects praised as important on speech.

However, in environments favourable to entrepreneurial experimentation and with the help of decision-makers, it is possible to design innovative strategies aimed at improving the sector. For example, the use of questionnaires could not only identify potential decision-makers interested in innovation, but also disseminate unknown approaches in the sector.

Moreover, as far as the methods used in this paper are concerned, the mixed approach between multiple choice surveys and open interviews has proved to be effective to get a general impression about a given market. The cross-tabulation analysis is a very interesting tool to evaluate hypothesis.

For future development a more powerful experiment (with more interviewees) and a more focused set of questions might bring deeper and more reliable results on the hospitality sector and could be replicated in other sectors where decision makers tend to make subjective based solutions and where their objective judgment is under questioning.

In few words, this paper presents a first step to pave the way towards a more impactful and effective innovation strategy, following these steps:

- Verify the availability of current solutions;
- Assess the spoken opinion of the user;
- Compare it with effective actions performed;
- Deepen the knowledge using mixed pooling and statistical analysis;
- Identify possible discrepancies between speech and action;
- Re-think your innovation proposal to meet the real (yet not explicit) requirements of your target.

This workflow is suitable for highly dynamic and advanced environments like the IdeaSquare, especially when dealing with desirable and virtuous products, but expensive or slow paying business models, as the one here discussed.

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APPENDIX

This section collects the survey with the precise questions asked to the interviewees, and the results of the answers received.

Table 1 shows the questions sent to decision-makers in the hospitality sector. The questions were elaborated and applied originally in the Italian language; the reported data has been translated for this article.

Table 1 - Questions in the online survey

#	Question	Type
Q1	What is the percentage of rooms occupied annually?	Multiple choice (4), single answer
Q2	Are you happy with the margin made on revenues?	Scale from 1 to 10
Q3	How much renovation do your facilities need?	Scale from 1 to 10
Q4	How much do energy consumption impact your earnings?	Scale from 1 to 10
Q5	What percentage of the budget is invested on marketing?	Scale from 1 to 10
Q6	What percentage of the budget is invested on the restructuring?	Scale from 1 to 10
Q7	What percentage of the budget is invested on energy efficiency?	Scale from 1 to 10
Q8	What are the initiatives that you have carried out in the field of sustainability?	Multiple choice (8), multiple answer
Q9	Why didn't you invest more in sustainability?	Multiple choice (7), multiple answer
Q10	Sustainability initiatives, in accommodation facilities, lead to:	Multiple choice (8), multiple answer
Q11	How would you make the hotel infrastructure more structural and energy sustainable?	Open question, text response
Q12	Which of these sustainability initiatives would you like to implement within your facility?	Multiple choice (7), multiple answer

Table 2 - Average occupation level of the hotel (Q1)

Answer	% of respondents
0-25%	32%
26-50%	14%
51-75%	41%
76-100%	14%

Table 3 – Sustainability initiatives undertaken (Q8)

Answer	% of respondents
Use of recycled paper, incentivised separate collection by the customer	68%
Eliminated single-use packs, significantly reduced plastic	68%
To favour organic / zero km / vegan menus	64%
Bike rental, built charging station for electric cars, shuttle provided	41%
Recycling of water, organic wet	41%
Use of renewable sources	36%
Furnishings built with local material, recyclable / recycled material	27%
Replacement of windows, building energy requalification, class A+ appliances	5%

Table 4 – Main barriers towards sustainability (Q9)

Answer	% of respondents
Few concessions	50%
Economic difficulties	41%
Complexity of application	27%
Low knowledge	27%
Bureaucratic difficulties	23%
Reputedly not economically efficient	9%
It is not considered useful	5%

Table 5 – Perceived benefits of sustainability (Q10)

Answer	% of respondents
Have a positive local impact	64%
Reduces the hotel's costs	59%
Improves the life on the planet	55%
Is perceived positively by the clients	55%
Increases client's demand	23%

Table 6 – Desired initiatives not yet implemented (Q12)

Answer	% of respondents
Use of photovoltaic panels	64%
Isolation of surfaces and adoption of ventilation systems	45%
Use of ecological / biodegradable detergents	36%
Construction of green roof or bio-pool	32%
Increase accessibility of the facility by public transport or cycle paths	27%
Using more efficient appliances	27%
Use of heat pump or biomass boiler	18%