Research Article

Building smart brands through online and artificial intelligence tools: A quantitative analysis about the best hospitals in Spain

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ARTICLE INFO	ABSTRACT
	Building a reputed brand constitutes a priority for hospitals interested in establishing positive relationships with their stakeholders. However, hospitals face different challenges: limited budgets, strict legal frameworks, etc. To overcome these challenges, many hospitals resort to online and artificial intelligence tools. This paper analyzes how hospitals manage both tools to improve their relationships with stakeholders and reinforce their brand reputation. To do that, we conducted a literature review about smart branding in hospitals, and then we defined 34 quantitative indicators to evaluate how the 100 best hospitals in Spain managed their websites, online newsrooms, about us sections and artificial intelligence departments for branding purposes. Our results proved that most hospitals focused their smart branding initiatives on patients (4.98 criteria out of 11) and not on media companies (3.14/11) or public authorities (3.14/6). We concluded that hospitals should implement integrated communication strategies, use artificial intelligence to brand their employees, and establish more professional practices in their communication departments. **Keywords:** hospitals, corporate communication, brand, reputation, artificial intelligence

INTRODUCTION

Building a reputed brand constitutes a priority for hospitals interested in establishing positive relationships with their stakeholders. Thanks to a powerful brand, hospitals improve their relations with employees, launch health education campaigns addressed to patients, collaborate with media companies, and develop research projects along with public health authorities. However, these organizations face different barriers that make it difficult for them to build a reputed brand: limited budgets for corporate communication initiatives, strict legal frameworks, stakeholders' new information and emotional needs, international competition among hospitals, development of new business models, etc. To overcome these barriers, more and more hospitals resort to online and artificial intelligence tools, such as mobile applications, social media, or online consultations. Thanks to these platforms, hospitals implement more dynamic relationships with their stakeholders, and lead an internal change that contributes to build the brand in a collective way.

This paper aims to analyze how hospitals manage both online and artificial intelligence tools to improve their relationships with stakeholders and build a more reputed brand. To do that, we conducted a literature review about corporate communication in hospitals: brand architecture, personal branding, online branding through patient portals and social media platforms, role of mobile apps and impact of artificial intelligence. Then, we resorted to the world's best hospitals 2023, a ranking published by *Newsweek* and *Statista,* to analyze how the 100 best hospitals in Spain managed smart branding initiatives to reinforce their reputation. Then, we defined 34 branding indicators that we grouped in four categories according to platforms and targets:

(1) patients and society (homepage),

(2) media companies (online newsroom),

(3) public authorities, suppliers and shareholders (about us section), and

(4) employees (artificial intelligence department).

Finally, we presented our results and proposed three main conclusions to help hospitals build a reputed brand through smart initiatives based on online and artificial intelligence tools.

FROM HOSPITAL COMMUNICATION TO SMART BRANDING

Hospital's Brand

Hospitals promote their brands in an integrated way and provide stakeholders with meaningful content that is consistent with the organization's roots (Lithopoulos et al., 2021; Rindell & Santos, 2021). However, to efficiently implement a holistic authentic brand, the first step consists of defining the hospital's brand architecture: identity, values, culture, mission and vision (Medina et al., 2020). Identity refers to the hospital's purposes and beliefs and involves the use of symbols and behaviors (Singla & Sharma, 2021). Corporate values describe in a more tangible way how the company develops its internal and external projects (Sander et al., 2021). These values are directly related to the hospital's culture, which refers to how employees behave to become a unique organization (Li & Zhao, 2021). Finally, the mission defines the organization's objectives in the midterm, meanwhile the vision refers to the long-term goals (Hart & Phau, 2022). Once hospitals have clearly depicted their brand architecture, they ensure that it is consistent with ethical principles and legal frameworks (Basha et al., 2022). Finally, they design and execute corporate communication initiatives to promote their brand architecture and influence their stakeholders' perceptions: employees, patients, media companies (Reitsamer et al., 2021).

When promoting their brand architecture, some hospitals resort to their employees and implement personal branding campaigns (Rahman et al., 2021). Even if these campaigns are determined by several elements–employees' self-development, relationships with peers, ethics (Basha et al., 2022)–, they clearly contribute to improve doctors' and nurses' reputation, as well as the hospital's brand. Thanks to these campaigns, doctors enhance their scientific credibility, social reputation and public image (Zhang et al., 2021), which helps them to improve their relationships with patients (Ren et al., 2021), as well as media companies and public health authorities (Etheredge & Fabian, 2022). Concerning nurses, they also benefit from these campaigns. Thanks to these campaigns, nurses promote the sense of unity among them (Godsey et al., 2020), understand patients' new needs in terms of information and emotional support (Zhang et al., 2021), and reinforce patients' loyalty towards the hospital (Wu et al., 2019). Finally, personal branding campaigns also bring benefits to hospitals since these organizations improve their relationships with patients and reinforce their scientific credibility (Tan et al., 2020).

Besides personal branding campaigns, hospitals resort to other corporate communication initiatives to promote their brands (Khosravizadeh et al., 2021). First, they conduct research about stakeholders, competitors, trends and legal issues affecting the hospital's brand to take better decisions concerning strategy and creativity (Odoom et al., 2019). Second, they implement corporate communication actions based on traditional media -events, media relations- as well as new platforms–websites, social media–(Govers, 2020). And third, they develop corporate social responsibility plans addressed to different targets, such as employees, public authorities, or patients' associations (Lithopoulos et al., 2021; Zhao et al., 2021). Thanks to these initiatives, hospitals positively influence their stakeholders' perceptions and promote their brand (Xifra, 2020; Wang et al., 2020).

Branding Hospitals Through Smart Technologies

Multidimensional health care, including the use of websites and patient portals, has been shown to be very successful; that is why many hospitals resort to these platforms for medical reasons, but also for branding purposes (Farsi, 2021). Thanks to corporate websites, hospitals enhance their relationships with patients, implement health education campaigns and reinforce their social legitimacy (Barredo et al., 2021). In other words, corporate websites help hospitals to revitalize their brands and become more dynamic organizations (Shieh et al., 2020). On the other hand, patient portals have become a common tool for patients who want to strengthen their empowerment and interact with doctors in a more efficient way (Parsons et al., 2020). Thanks to these portals, hospitals provide patients with meaningful content about diseases, treatments and internal procedures (Tong et al., 2021). Both websites and patient portals contribute to reinforce hospitals' scientific credibility (Jenkins et al., 2020; McKeown et al., 2021).

Besides corporate websites and patient portals, many hospitals manage social media platforms to promote their brands and build better relationships with stakeholders (Shieh et al., 2020). When using social media, hospital follow a corporate communication approach focused on satisfying their stakeholders' information and emotional needs (Medina et al., 2021). Thanks to social media platforms, hospitals reinforce their emotional, social and professional relationships with stakeholders (Wu et al., 2019), which helps the last ones to become an active part of the hospital's collective branding processes (Yantian et al., 2022). On the other hand, many hospitals integrate their social media platforms with mobile applications (Confente & Kucharska, 2021). Thanks to these applications, hospitals launch learning initiatives addressed to doctors and nurses (Chamberlain et al., 2021), reinforce patients' skills in health literacy (Crossley et al., 2020) and implement health education campaigns (Mackert et al., 2020).

Promoting the hospital's brand cannot be considered an intangible asset, but something that gives rise to practical behaviors and changes within the organization (Odoom et al., 2019). One of these practical changes refers to the integration of artificial intelligence into medical protocols. This technology allows hospitals to become more innovative organizations (Lv & Qiao, 2020) and improve their patients' medical outcomes (Shilo et al., 2020). However, this technology is also useful for branding purposes. On the one hand, thanks to artificial intelligence, hospitals analyze large amounts of data in a cost-effective manner and understand their stakeholders' perceptions in a clearer way (Tsai et al., 2021). And on the other hand, artificial intelligence-based tools allow hospitals to implement more visual, creative campaigns that reinforce the organization's brand (Butow & Hoque, 2020). In other words, thanks to artificial intelligence, hospitals can lead a medical and communication revolution, and become more dynamic brands (Bian & Haque, 2020).

Impact of Smart Branding on Hospital's Stakeholders

Smart technologies help hospitals to lead a branding revolution that focuses on integrating technology into different organizational processes and establishing new relationships with stakeholders (Medina et al., 2021). Thanks to this branding revolution, doctors and nurses change their mentalities and start working differently (Farsi, 2021). Both use social media platforms and mobile apps to optimize their time and provide patients with a better content (Parker et al., 2021). Besides, they grow from a professional perspective since they assume new responsibilities: training patients in online health education, monitoring patients through mobile apps, publishing medical content on social media (Marca-Frances et al., 2020). In other words, doctors and nurses become experts in satisfying their patients' needs from a medical, emotional and social perspective (Reza et al., 2022), which helps them to reinforce their professional credibility and their social legitimacy (Mackert et al., 2020).

Besides doctors and nurses, the branding revolution positively influences on patients. Thanks to nurses' and doctors' new mentalities and behaviors, patients can actively participate in collective making-decision processes concerning their health (Mackert et al., 2020). Patients become active players in the healthcare system, they reinforce their empowerment (Valizadeh & Ghasemi, 2020) and they contribute to make hospitals more human organizations (Nichols et al., 2021). Besides, they build a more efficient organization by requiring new services such as electronic medical records (Tseng et al., 2020), new legal frameworks that protect their rights (Komorowski et al., 2020) as well as new organizational processes that prioritize their

medical and emotional needs (Schmit et al., 2020). In other words, thanks to the smart branding revolution, patients become opinion leaders who determine the hospital's reputation (Bol et al., 2020).

Finally, media companies also benefit from this smart branding revolution since hospitals produce and share with them a more professional content about treatments, diseases and health education (Mheidly & Fares, 2020). When developing this content, some hospitals resort to different disciplines, such as sociology, anthropology or philosophy (Kreps, 2020). This way, they produce a high-quality content that subsequently media companies can use for different purposes, such as health education campaigns (Rudd, 2022). On the other hand, thanks to social media and mobile apps, hospital's employees can interact with media companies in an easier way and become opinion leaders (Medina et al., 2021). Finally, hospitals can also use both applications to train journalists in healthcare and this way fight misinformation, which reinforces hospitals' and media companies' scientific credibility (Mheidly & Fares, 2020).

METHODOLOGY

The smart branding revolution have led hospitals to integrate social media, mobile apps, artificial intelligence and other technological platforms into their corporate communication initiatives. In order to analyze how these organizations use these platforms to make their brands more dynamic, we conducted a quantitative analysis based on the world's best hospitals 2023, a ranking elaborated by *Newsweek* and *Statista*. Both organizations analyze every year 2,300 hospitals from 28 countries considering four indicators:

(1) 80.000 online surveys to medical experts from 28 countries,

(2) patients' opinions about hospitals,

(3) hospitals' quality metrics, and

(4) PROM questionnaires concerning patients' quality of life.

To calculate each hospital's score and position in the ranking, the following weights are considered: online surveys to medical experts (54.00%), patients' opinions (14.50%), hospitals' quality metrics (29.00%) and PROM questionnaires (2.50%). Finally, results are confirmed by a global board of medical experts from France, Germany, Israel, Switzerland, and the United States (Newsweek, 2023). Thanks to this ranking, we identified the 100 best hospitals in Spain (**Appendix A**). We evaluated how each organization managed smart technologies to establish a more dynamic relationship with their stakeholders:

(1) patients and society,

(2) media companies,

(3) public authorities, suppliers, and shareholders, and

(4) employees.

Several reasons led us to consider these stakeholders: patients are true opinion leaders who influence on the hospital's brand (Driever et al., 2020); media companies can determine hospital's scientific credibility (Etheredge & Fabian, 2022); public authorities play a key role in hospitals' medical and education projects (Parker et al., 2021); and employees represent the hospital's brand and are an essential part of these organizations' reputation processes (Medina et al., 2020). We conducted a quantitative analysis from 20th July to 16th August 2023 to understand how the 100 best hospitals in Spain managed smart technologies to improve their relationships with stakeholders and build a more reputed brand. To do that, we defined 34 brand indicators that we grouped in four main categories according to platforms and stakeholders:

(1) homepage (patients, society),

(2) online newsroom (media companies),

(3) about us (public authorities, suppliers, and shareholders), and

(4) Department of artificial intelligence (employees) (**Table 1**).

We only considered official websites. We resorted to the binary system to analyze each indicator. Finally, to ensure that results were valid, we implemented the following methodology: the first author analyzed the first 50 hospitals, the second author focused on the last 50 hospitals, and the third author reviewed results concerning the 100 hospitals.

Table 1. Brand indicators

1. Homepage: Patients & society	2. Online newsroom: Media companies	3. About us: Public authorities, suppliers, & shareholders	4. Artificial intelligence department: Employees
1. Hospital's homepage 2. Patient portal 3. Mobile apps 4. Symptom checker 5. Video consultations with doctors 6. Chatbot 7. Interactive maps 8. Virtual tours 9. Interactive health library 10. Podcasts 11. Social media platforms	1. Newsroom 2. Digital press archives 3. Interactive infographics 4. B-roll videos 5. Podcasts 6. Interactive corporate reports 7. Online translation services 8. Online interviews with doctors 9. Online press conferences 10. News alerts 11. Mobile apps or platforms for journalists	1. About us section 2. Videos 3. Interactive infographics 4. Interactive corporate documents 5. Suppliers platform 6. Shareholders platform	1. Artificial intelligence department 2. Integrating artificial intelligence into medical protocols 3. Training employees 4. Research projects 5. Collaboration with universities or research centers 6. Collaboration with external technological partners

RESULTS

Most Spanish hospitals resort to different smart branding initiatives to improve their relationships with stakeholders and build a reputed brand. However, some of them can still improve in this area: use of platforms, quality content, integration of channels, etc. In order to justify this sentence, we present our results grouped in four main categories:

(1) homepage,

(2) newsroom,

(3) about us section, and

(4) artificial intelligence department.

Homepage

According to our results, 87.00% of hospitals had a website and a homepage. Even if most of them complied with some indicators (social media platforms–89.16%–, mobile apps–63.86%–), many hospitals did not respect other criteria: patient portal (57.83%), virtual tours (42.17%), podcasts (42.17%), interactive maps (40.96%), interactive health library (32.53%), video consultations with doctors (12.05%), chatbot (8.43%), and symptom checker (0.00%). On average, hospitals fulfilled 4.89 indicators out of 11 applicable. Finally, the best hospitals in this category were *Hospital Clínic de Barcelona* (10 indicators), *Hospital Universitari Vall d'Hebron*, *Clinica Universidad de Navarra*, and *Centro Médico Teknon* (nine indicators).

Newsroom

Our data proved that 85.54% of hospitals managed online newsrooms. However, most of them only fulfilled one indicator: digital press archives (92.96%). The other ones were barely respected: B-roll videos (50.70), interactive corporate reports (50.70), online translation services (8.45%), news alerts (7.04%), interactive infographics (4.23%), podcasts (0.00%), online interviews with doctors (0.00%), online press conferences (0.00%), and mobile app or platform for journalists (0.00%). On the other hand, 83.00% of hospitals respected between two and four criteria out of 11 applicable, and the best one in this category was *Clinica Universidad de Navarra* (**Table 2**).

Table 2. Best hospitals: Online newsroom

Hospital	Number of criteria (out of 11)
Clinica Universidad de Navarra	7
Hospital de Sant Joan de Déu & Hospital de Sant Joan de Déu Barcelona–Pediatrics*	6
Hospital Universitari Vall d'Hebron, Hospital Universitario Fundación Jiménez Díaz, Hospital Universitario la Zarzuela, & Hospital Universitari de Bellvitge	5

Note. *Hospital de Sant Joan de Déu & Hospital de Sant Joan de Déu Barcelona–Pediatrics used the same website

About Us

Most Spanish hospitals showcased an about us section: 90.36%. However, most of them did not comply with many indicators: interactive corporate documents (62.66%), videos (29.33%), suppliers platform (9.33%), interactive infographics (6.67%), and shareholders platform (0.00%). In fact, on average hospitals fulfilled 2.08 indicators out of six applicable. The only hospitals respecting four criteria were: *Hospital Universitari Vall d'Hebron*, *Clinica Universidad de Navarra*, *Hospital Universitario la Zarzuela*, and *Hospital Vithas Valencia 9 de Octubre*.

Artificial Intelligence Department

According to our quantitative analysis, *Hospital de la Santa Creu i Sant Pau* was the only one having an artificial intelligence department: functional unit of digital health (*unidad funcional de salud digital*). This department tried to integrate artificial intelligence into different medical protocols, trained its employees in this area, carried out research projects, and collaborated with external technological companies such as *Capgemini*, *Cisco*, *Exheus*, *Intel*, *Microsoft*, or *Vodafone*. However, they had not implemented any project with universities or research centers. On the other hand, 45 hospitals did not have an artificial intelligence department, but they developed research projects about this area in collaboration with external organizations (**Table 3**). Besides, 29 hospitals had not implemented this department, but they developed research projects in-house about artificial intelligence, without collaborating with any external company. Finally, 25 hospitals did not mention anything about artificial intelligence in their corporate communication platforms.

Table 3. Hospitals & external partners

No	Hospital	Universities & research centers	Technological companies
1	Hospital Universitario La Paz	Universidad Complutense de Madrid & Ministerio de Ciencia e Innovación	Agencia Espacial Europea, GE Healthcare, & Microsoft
2	Hospital Clínic de Barcelona		Huawei, Roche Diagnostics, Enzyme, Aidoc, Barcelona Supercomputing Center, & Amazon Web Services
3	Hospital Universitario 12 de Octubre	Universidad Politécnica de Madrid, Universidad Politécnica de València, & Instituto de Investigación Sanitaria del Hospital Clínico Universitario de Valencia	SpotLab & HOH Health
4	Hospital Universitari Vall d'Hebron	Universidad Complutense de Madrid & FEDER	Philips & Iomed Medical Solutions
5	Hospital General Universitario Gregorio Marañón	Massachusetts Institute of Technology	Dedalus Iberia
6	Clinica Universidad de Navarra	University of Navarra	Iomed Medical Solutions & Siemens Healthineers
7	Hospital Universitario Ramón y Cajal		Tucuvi Care
8	Hospital Universitario y Politécnico la Fe	Sociedad Europea de Oncología Pediátrica	Quibim
9	Hospital Clínico San Carlos	Universidad Politécnica de Madrid-CIBER-BBN & Universidad Complutense de Madrid	SpotLab, Nubaj IT & Consulting
10	Hospital Universitario Virgen del Rocío	Asociación Española para los Efectos del Tratamiento del Cáncer	PharmaNest & Honda Research Institute
11	Hospital Universitario Puerta de Hierro		Alhambra IT
12	Hospital Universitario Marqués de Valdecilla		Microsoft & Amazon Web Services
13	Hospital Ruber Internacional		Philips
14	Hospital Quirónsalud Barcelona		Medtronic
15	Centro Médico Teknon	Universidad Politécnica de Catalunya	Sense4Care, APFtech, & Medtronic
16	Hospital Quirónsalud Madrid		Arterys
17	Hospital Universitari de Bellvitge	Univerzitetni Klinicni Center Ljubljana, Univerzitetni Klinicni Center Maribor, & University College London	Löwenstein Medical Innovation GmbH, & Accelopment Schweiz AG
18	Hospital Universitario Reina Sofía	Fundación Mutua Madrileña & Instituto Maimónides de Investigación Biomédica de Córdoba	

Table 3 (Continued). Hospitals & external partners

No	Hospital	Universities & research centers	Technological companies
19	Hospital Clínico Universitario de Valencia	Universidad Politécnica de Valencia & Investigación Sanitaria INCLIVA	
20	Hospital Quirónsalud Málaga		GE HealthCare & Telefonica
21	Hospital Universitario de la Princesa	Instituto Carlos III	Tucuvi Care
22	Complejo Asistencial Universitario de Salamanca	Instituto de Investigación Biomédica de Salamanca, & Universidad de Salamanca	
23	Hospital Universitari Sagrat Cor		Ephion Health & Philips
24	Hospital Universitario HM Montepríncipe	Universidad Camilo Jose Cela	Microsoft
25	Hospital HLA Universitario Moncloa	IE Business School	Medtronic, Transmural Biotech, & Eniax
26	Hospital Universitario San Roque	Universidad Politécnica de Valencia	Wise Dreams & Legit Health
27	Hospital Vithas Valencia 9 de Octubre		Mindray
28	Hospital Universitario HM Madrid	Universidad Politécnica de Madrid	Microsoft & AURA Innovative Robotics
29	Hospital Universitario de Cruces		Legit Health, DIVE Medical, Huawei, & Ibermatica
30	Hospital Germans Trias i Pujol	Universidad Rovira i Virgili, Universidad de Girona, & Mobile World Capital Barcelona	Aruba Networks, Semic, Eurecat, & Barcelona Supercomputing Center
31	Hospital del Mar	Instituto Hospital del Mar de Investigaciones Médicas	Pure Storage
32	Hospital Universitario de Basurto		Legitech
33	Hospital Universitario Virgen de la Victoria	Universidad de Malaga	Philips
34	Hospital Universitario Donostia	Universidad del Pais Vasco	Cyber Surgery
35	Hospital Universitario Rey Juan Carlos	Instituto de Investigación Sanitaria de la Fundación Jiménez Díaz	
36	Hospital Universitario Fundación Alcorcón		Iomed Medical Solutions
37	Hospital General Universitario Santa Lucía	Instituto Murciano de Investigación Biosanitaria, Fundación para la Formación e Investigación Sanitaria, Universidad Católica de Murcia, & Universidad Politécnica de Cartagena	
38	Hospital de Sant Joan de Déu*	Universidad Politécnica de Catalunya & Fundación La Caixa	Softbank Robotics
39	Hospital Universitario de Jaén	Universidad de Jaen	Proscia
40	Hospital Universitario del Vinalopó		Tucuvi Care, Visualfy, & Cynara
41	Hospital Universitario Príncipe de Asturias	Universidad de Alcalá, Fundación de Investigación, & Universidad Autonoma de Santo Domingo	Hewlett Packard
42	Hospital Vithas Xanit Internacional		Mindray & Daiichi Sankyo
43	Hospital HM Nou Delfos	Massachusetts Institute of Technology	Microsoft & GE Healthcare
44	Centre Fòrum - Geriatric & Psychiatric	Instituto Hospital del Mar de Investigaciones Médicas	Pure Storage
45	Hospital de Sant Joan de Déu Barcelona–Pediatrics*	Universidad Politécnica de Catalunya & Fundación La Caixa	Softbank Robotics

Note. *Hospital de Sant Joan de Déu & Hospital de Sant Joan de Déu Barcelona–Pediatrics used the same website

After analyzing all indicators related to smart branding initiatives, we can state that 33.33% of hospitals only respected between 11-15 indicators out of 34 applicable. Finally, as shown in **Table 4**, the two best hospitals in Spain in this area were *Clinica Universidad de Navarra* and *Hospital Universitari Vall d'Hebron*.

Table 4. Best hospitals in Spain

Hospital	Number of criteria (out of 34)
Clinica Universidad de Navarra	20
Hospital Universitari Vall d'Hebron	18
Hospital Clínic de Barcelona, Hospital Universitario la Zarzuela, Hospital de Sant Joan de Déu, & Hospital de Sant Joan de Déu Barcelona–Pediatrics	17

Note. *Hospital de Sant Joan de Déu & Hospital de Sant Joan de Déu Barcelona–Pediatrics used the same website

DISCUSSION

Patients are true opinion leaders who can determine other stakeholders' perceptions about the hospital and its services (Caron et al., 2020). That is why, when these organizations develop online tools (websites, social media, etc.), they must include patients at an early stage and consider their information needs (Zegers et al., 2021). This way they can help patients improve their skills in health literacy (Luo et al., 2020) and establish better relationships with them (Rahman et al., 2021). However, our results demonstrated that 43.37% of hospitals only respected four-six criteria out of 11 applicable to the homepage. In fact, only 12.05% of hospitals proposed video consultations with doctors, and none of them had a symptom checker. These results prove that Spanish hospitals must do an effort to develop more useful homepages and this way establish better relationships with patients. Analyzing patients' needs in terms of information and emotional support, integrating different platforms, and developing a useful content is essential to make hospitals' homepages more relevant.

Some hospitals integrate different technological tools into their organizational processes to enhance patients' medical outcomes (Shi et al., 2020), but also to improve their relationships with other stakeholders, such as media companies (Minou et al., 2020). On the other hand, hospitals should train their employees in corporate communication skills so that they can efficiently represent the brand when they interact with media companies (Medina et al., 2021). But after analyzing Spanish hospitals' online newsrooms, we proved that most of them did not consider media companies as a main target: that is why no hospital proposed podcasts, mobile apps for journalists, online interviews with doctors or online press conferences. These facts show that Spanish hospitals need to revisit their media relations strategies and become more flexible organizations able to provide journalists with meaningful content, in several formats and a regular basis.

Public health authorities play a key role in health education (Tseng et al., 2020). These organizations collaborate with hospitals to develop a credible content (Caron et al., 2020) that is consistent with patients' new requirements in terms of formats and languages (Berg et al., 2021). However, based on our results concerning the About us section, we can state that most Spanish hospitals remained conservative when interacting with public authorities, that is why they focus on corporate documents (62.66%), and not on interactive infographics (6.67%) or corporate videos (29.33%). Spanish hospitals need to become more dynamic organizations and provide public authorities, as well as shareholders and suppliers, with meaningful content that represents the organization's brand architecture.

Hospitals' employees need to be trained in artificial intelligence: protocols, advantages, risks, ethical principles (Rickert, 2020). They represent the hospital, but also the medical profession, that is why they need to become experts in artificial intelligence (Abuhammad et al., 2020). Thanks to this expertise, hospital's employees reinforce their personal brand and improve their relationships with patients (Reza et al., 2022). Even if these concepts are valid from a theoretical perspective, our analysis about Spanish hospitals' artificial intelligence department demonstrated that most of these organizations are not following this logic. In fact, only one hospital out of 100 had implemented an artificial intelligence department: *Hospital de la Santa Creu i Sant Pau*. Nevertheless, 46 hospitals that had not set up this department were very active in this area and developed different projects in collaboration with external companies such as *GE Healthcare*, *Microsoft* or *Philips*. These collaborations represent an interesting opportunity for hospitals to reinforce their expertise in artificial intelligence, but also to develop co-branding initiatives that reinforce their reputation.

This paper aimed to analyze how the Spain's best hospitals managed online and artificial intelligence tools to enhance their relationships with stakeholders and reinforce their brand reputation. Our research showed that, even if most of them had implemented different initiatives (websites, social media platforms, mobile apps, etc.), they still need to improve in this area: quality of content, integration of platforms, analysis of

stakeholder's information needs, etc. Despite these interesting facts, we must highlight some limitations affecting this paper. First, we could not contact each hospital's communication department, which avoid us to better know their budgets, annual communication plans, and artificial intelligence projects. Second, we could not find any other paper analyzing similar facts in Spain, that is why we could not compare our results and hone our conclusions. And third, we did not consider the Spanish legal framework affecting hospitals, which highly determines how these organizations communicate with their stakeholders. Lastly, researchers interested in this area could focus their papers on how to integrate artificial intelligence into the hospital's branding initiatives, how to use mobile apps to make organizational processes more dynamic, and how to train doctors and nurses in branding skills.

CONCLUSIONS

Hospitals manage different corporate communication initiatives (media relations, events, etc.) to promote their brands and improve their relationships with stakeholders. However, stakeholders' new needs in terms of information and emotional support have led many hospitals to revisit their corporate communication strategies. In this framework, some hospitals have implemented smart branding initiatives based on online and artificial intelligence tools to make their communication initiatives more dynamic. This paper aimed to analyze how the Spain's best hospitals managed smart branding initiatives to enhance their relationships with stakeholders and reinforce their brand reputation. After analyzing this area from a qualitative and quantitative perspective, we can highlight three last ideas. First, most Spanish hospitals focused their smart branding initiatives on patients (4.98 indicators out of 11) rather than media companies (3.14/11) or public authorities (3.14/6); however, they did not provide patients with enough applications and platforms. This fact proved that Spanish hospitals need to implement integrated communication strategies that consider all stakeholders' information and emotional needs, and that contribute to integrate those stakeholders into the hospital's collective branding processes. Second, the fact that 99.00% of hospitals did not have an artificial intelligence department demonstrated that these organizations need too much time to adapt to their stakeholders' new medical needs, which can represent a problem from a public health and a reputation perspective. These organizations need to increase their investments in technology and use artificial intelligence as an added value that reinforces their employees' brand as well as the organization's reputation. And third, only 6 hospitals complied with at least 50% of all indicators considered, which proved that these organizations need to make their branding communication strategies much more professional: defining the hospital's brand architecture, developing annual communication strategies, and implementing evaluation systems would help hospitals to build more reputed brands.

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APPENDIX A: LIST OF HOSPITALS ANALYZED

1. Hospital Universitario La Paz
2. Hospital Clínic de Barcelona
3. Hospital Universitario 12 de Octubre
4. Hospital Universitari Vall d'Hebron
5. Hospital General Universitario Gregorio Marañón
6. Clínica Universidad de Navarra
7. Hospital Universitario Ramón y Cajal
8. Hospital Universitario y Politécnico la Fe
9. Hospital Universitario Fundación Jiménez Díaz
10. Hospital Clínico San Carlos
11. Hospital Universitario Virgen del Rocío
12. Hospital Universitario Puerta de Hierro
13. Hospital Universitario Marqués de Valdecilla
14. Hospital de la Santa Creu i Sant Pau
15. Hospital Ruber Internacional
16. Hospital Universitario Madrid Sanchinarro
17. Hospital Quirónsalud Barcelona
18. Centro Médico Teknon
19. Hospital Quirónsalud Madrid
20. Hospital Universitario la Zarzuela
21. Hospital Universitari Quirón Dexeus
22. Hospital Universitari de Bellvitge
23. Hospital Universitario Virgen Macarena
24. Hospital Universitario Dr. Peset Aleixandre
25. Hospital Universitario Reina Sofía
26. Hospital Universitario Virgen de Las Nieves
27. Hospital Universitario de A Coruña
28. Hospital Clínico Universitario de Valencia
29. Hospital Universitario Infanta Leonor
30. Hospital Universitario Miguel Servet
31. Hospital Clínico Universitario de Valladolid
32. Hospital Quirónsalud Málaga
33. Hospital Universitario de la Princesa
34. Complejo Asistencial Universitario de Salamanca
35. Hospital Universitario Central de Asturias
36. Hospital Universitari Sagrat Cor
37. Hospital Universitario HM Montepríncipe
38. Hospital HLA Universitario Moncloa
39. Hospital Universitario Regional de Málaga
40. Hospital General Universitario Reina Sofía
41. Hospital Quirónsalud Sagrado Corazón
42. Hospital Clínico Universitario Virgen de la Arrixaca
43. Hospital Universitarios San Roque
44. Hospital Vithas Valencia 9 de Octubre
45. Hospital General de Ciudad Real
46. Hospital Universitario Rio Hortega
47. Consorcio Hospital General Universitario de Valencia
48. Hospital Clínico Universitario de Santiago
49. Hospital Galdakao-Usansolo
50. Hospital Universitario Nuestra Señora de Candelaria
51. Hospital de Barcelona
52. Hospital General Universitario de Alicante
53. Hospital Universitario HM Madrid
54. Hospital Universitario de Cruces

55. Hospital Germans Trias i Pujol
56. Hospital del Mar
57. Hospital Costa del Sol
58. Hospital Universitario de Móstoles
59. Hospital Universitario de Basurto
60. Hospital Universitario Virgen de la Victoria
61. Hospital Universitario Donostia
62. Hospital Universitario Rey Juan Carlos
63. Hospital Universitario Fundación Alcorcón
64. Hospital General Universitario Morales Meseguer
65. Hospital Universitario de Araba
66. Hospital Universitario Virgen de Valme
67. Complejo Hospitalario Universitario de Badajoz
68. Hospital Universitario Clínico San Cecilio
69. Complejo Hospitalario Universitario de Albacete
70. Hospital Universitario Torrecárdenas
71. Complejo Hospitalario Universitario de Cáceres
72. Complejo Hospitalario Universitario de Vigo
73. Hospital General Universitario Santa Lucía
74. Hospital Universitario de Gran Canaria Doctor Negrín
75. Hospital Universitario de Getafe
76. Hospital Universitario Severo Ochoa
77. Hospital Clínico Universitario Lozano Blesa
78. Hospital San Pedro
79. Hospital Central de la Defensa Gómez Ulla
80. Hospital de Sant Joan de Déu
81. Hospital Universitario San Juan de Alicante
82. Clínica Sagrada Família
83. Complejo Asistencial Universitario de León
84. Complejo Hospitalario Universitario de Ferrol
85. Hospital Universitario La Moraleja
86. Hospital Universitario de Jaén
87. Hospital Universitario del Vinalopó
88. Hospital Universitario Príncipe de Asturias
89. Hospital Universitari Dr. Josep Trueta
90. Hospital Universitari General de Catalunya
91. Hospital La Luz
92. Hospital Clínica Benidorm
93. Hospital Vithas Xanit Internacional
94. Hospital Universitario Puerta del Mar
95. Clínica Nostra Senyora del Remei
96. Hospital HM Nou Delfos
97. Hospital Royo Villanova
98. Complejo Asistencial de Segovia
99. Centre Fòrum-Geriatric & Psychiatric
100. Hospital de Sant Joan de Déu Barcelona–Pediatrics