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RESEARCH ARTICLE

Building Reputed Brands through Smart Technologies: A Quantitative Analysis of the Best Hospitals in the United Kingdom

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ABSTRACT

Smart technologies such as artificial intelligence and big data have transformed hospitals from a medical, management and communication perspective. This paper aims to analyze how the best hospitals in the United Kingdom manage these technologies to build a reputed brand. To do that, we conducted a literature review about smart technologies and online branding processes in hospitals. Then, we defined 34 indicators to evaluate how the 140 best hospitals in the United Kingdom managed smart technologies for branding purposes. Our results proved that most of them focused their branding efforts on patients (4.98 criteria out of 11 applicable), rather than journalists (3.01/11) or public authorities (2.16/6). We concluded that hospitals should implement an integrated marketing communication approach, use smart technologies to establish new organizational processes with stakeholders, and develop digital transformation plans to efficiently manage this process.

Keywords: Artificial intelligence, Branding, Corporate communication, Hospitals.

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1. Introduction

Artificial intelligence, big data, telemedicine, and mobile applications have radically transformed hospital's organizational processes, as well as health professionals' mentalities and practices. In this new technological framework, hospitals integrate mobile applications into medical protocols, doctors use artificial intelligence-based tools to diagnose patients, and nurses resort to big data to monitor patients' medical outcomes. Thanks to smart technology, hospitals are becoming digital organizations, which also impacts their corporate communication strategies. Indeed, most hospitals resort now to websites, mobile applications, and social media platforms to reinforce their relationships with stakeholders, such as patients, employees, and media companies. However, using smart technologies for corporate communication purposes constitutes a challenge for these organizations: limited economic resources, lack of experts in this area, strict legal frameworks, and so on.

This paper aims to analyze how the best hospitals in the United Kingdom manage smart technologies to reinforce their relationships with stakeholders and build a reputed brand. To do that, we conducted a literature review about smart technologies in hospitals (artificial intelligence, big data, telemedicine), patients' privacy, hospitals' branding initiatives on social media, and the role of doctors and nurses in hospitals' online branding processes. Then, we defined 34 indicators to quantitatively evaluate how the 140 best hospitals in the United Kingdom managed websites, mobile apps, social media, and other smart platforms to implement branding initiatives addressed to their stakeholders: patients, media companies, shareholders, suppliers, public authorities, and employees. Finally, we presented our results as well as three main conclusions that could help hospitals all over the world to improve their online smart branding initiatives in the next years.

2. Smart Branding in Hospitals

2.1. Smart Hospitals

Hospitals resort to different technologies to improve their patients' medical outcomes: artificial intelligence, big data, telemedicine, health wearables (Howe & Elenberg, 2020). Artificial intelligence refers to the ability of computers or computer-controlled robots to perform tasks usually associated with doctors and nurses (Zegers *et al*., 2021). This technology determines the relationships between hospitals and patients from a medical, social, and legal perspective (Ramon Fernández, 2021). In fact, thanks to artificial intelligence, hospitals enhance medical imaging techniques (Kaissis *et al*., 2020), as well as diagnosis, treatments, and prognosis (Manrique de Lara & Peláez-Ballestas, 2020). Moreover, this technology contributes to optimize hospitals' internal processes: online appointments, data recording, etc. (Dhagarra *et al*., 2020). However, using artificial intelligence represents some challenges for these organizations: limited dataset availability for algorithms training and validation due to the absence of standardized electronic medical records (Lin & Hou, 2020), legal and ethical requirements (Shi *et al*., 2020), and security risks concerning patients' personal data (Kaissis *et al*., 2020). For this reason, before implementing any artificial intelligence-based tool, hospitals need to professionalize their internal processes and protect their patients' and doctors' rights (Tom *et al*., 2020).

Along with artificial intelligence, hospitals resort to big data to improve their patients' medical outcomes (Dhagarra *et al*., 2020). Thanks to big data, hospitals acquire large amounts of data from multiple sources and then they combine this data by using analytics tools (Ferretti *et al*., 2020). Thanks to results obtained, hospitals improve their internal processes and medical protocols (Shi *et al*., 2020), which positively influences on patients' medical outcomes (Howe & Elenberg, 2020). Using big data is especially useful to treat patients suffering from three diseases. First, infectious diseases. Hospitals resort to big data to collect, clean and integrate data from different sources, and this way better understand infectious diseases: trends, treatments, and risks (Wu *et al*., 2020). Second, obesity. Big data allows hospitals to monitor and analyze people's behaviours, which is useful for preventing obesity in some populations, such as children (Shahid *et al*., 2021). And third, rare diseases. Hospitals use big data to share information about rare diseases, understand health trends, and analyze patients' needs (Courbier *et al*., 2019).

Artificial intelligence, big data, telemedicine, and health wearables have transformed hospitals. However, these organizations must always consider the impact of this technology on their patients' privacy (Zhang *et al*., 2021). Protecting patients' right to privacy has become a medical and legal responsibility that hospitals must assume to be perceived as professional organizations (Fazal *et al*., 2022). To efficiently protect patients' privacy, hospitals implement several initiatives: communicating data protection efforts to patients, being proactive when hospitals face a privacy breach, and explaining the measures adopted to avoid these crises in the future (Trinidad *et al*., 2020). Besides, hospitals implement codes of conduct to help their employees use these technological tools professionally (Molnár-Gábor & Korbel, 2020). Finally, some hospitals implement different initiatives addressed to patients: explain to patients the importance of legal consent (Murdoch, 2021), educate patients on the impact of big data and artificial intelligence on medical treatments (Hulsen, 2020), and encourage patients to assume their individual responsibilities and ask questions to healthcare professionals (Belani *et al*., 2021).

2.2. Branding Smart Hospitals

Smart technology allows hospitals to improve their medical protocols; however, it also positively affects their branding processes (Lithopoulos *et al*., 2021). These processes refer to communication initiatives implemented by hospitals to influence their stakeholders' perceptions of the organization's brand (Odoom *et al*., 2019). Nevertheless, before implementing these processes, hospitals must define their brand architecture: identity, values, mission, vision, and culture (Medina Aguerrebere *et al*., 2020). According to Singla and Sharma (2021), identity refers to the main reasons why an organization is unique in society. To efficiently promote identity, hospitals define corporate values that guide the organization's internal and external processes (Sander *et al*., 2021). When companies respect their identity and values, they can achieve their mission and vision, which refer to the company's objectives in the mid-term and the long-term, respectively (Hart & Phau, 2022). Finally, the culture can be defined as the unique way in which employees behave to help the organization became a unique brand (Li & Zhao, 2021). Once hospitals have defined their brand architecture, they implement branding processes that must be consistent with the organization' roots (Rindell & Santos, 2021), its ethical principles, and the main legal framework (Sander *et al*., 2021).

When hospitals promote their brand, they focus on content useful for stakeholders from a medical, social, and emotional perspective (Lithopoulos *et al*., 2021). This meaningful content is essential to reinforce the hospital's brand credibility (Reitsamer & Brunner-Sperdin, 2021). On the other hand,

this content must also consider two main elements: culture and emotions. Cultural elements contribute to making hospitals' brands more dynamic (Tan *et al*., 2020), which positively influences doctor-patient relationships (Zhao, 2021). Concerning emotions, hospitals analyse their stakeholders' feelings to understand their needs better. This way, they build a more relevant brand (Rahman *et al*., 2021; Razmus, 2021). Integrating emotions and cultural elements into the hospital's branding allows these organizations to build a more dynamic brand (Hart & Phau, 2022; Tsai *et al*., 2021).

Hospitals use different platforms to implement their branding initiatives: social media, mobile apps, and so on (Medina Aguerrebere *et al*., 2020). These organizations use social media platforms to revamp their relationships with stakeholders and build a more reputed brand (Chou, 2021). To do that, hospitals need to be creative and train their employees to use these platforms professionally (Shieh *et al*., 2020). Once hospitals have trained their employees in this area, they can launch corporate communication initiatives to build their brand in a collective way along with their stakeholders (Kordzadeh & Young, 2018; Yantian *et al*., 2022). On the other hand, these organizations also manage mobile applications for branding purposes (Hart & Phau, 2022). Most of them train their doctors and nurses on how to use these applications to interact with patients (Chamberlain *et al*., 2021): promoting healthy habits, monitoring patients, reinforcing patients' skills in health literacy (Crossley *et al*., 2020). Thanks to mobile apps, hospitals improve their patients' medical outcomes and reinforce the organization's brand reputation (Mackert *et al*., 2020).

2.3. Smart Branding and Healthcare Professionals

Hospitals promote multidisciplinarity and integration to reinforce their branding processes; in that sense, they train their doctors to communicate efficiently with patients (Li & Xu, 2020). Doctors' skills in communication determine patients' perceptions of the hospital, its services, and its brand (Butow & Hoque, 2020). Patients view doctors as a human brand with a unique brand personality; that is why doctors should reinforce their skills in interpersonal and online communication to efficiently interact with patients (Reza *et al*., 2022). In other words, doctors need to reinforce their skills in telemedicine (Bassan, 2020) and artificial intelligence. This way, they can establish more dynamic relationships with their patients (Butow & Hoque, 2020). On the other hand, doctors should be trained to use corporate communication platforms for branding purposes, especially mobile apps, social media, and online communities (Medina Aguerrebere *et al*., 2020). Doctors can use mobile apps to promote health education initiatives addressed to patients (Mackert *et al*., 2020); they can manage social media platforms to support patients from an emotional perspective (Etheredge & Fabian, 2022); and they can participate in online communities to reinforce the hospital's scientific credibility (Wu *et al*., 2019).

Besides doctors, nurses also play a key role in hospitals' branding processes (Reza *et al*., 2022). Thanks to their skills in communication, nurses improve the hospital's internal processes (Rodrigues *et al*., 2020) and establish better relationships with patients (Nichols *et al*., 2021). These skills in communication help nurses reinforce their personal brand; however, they also need to reinforce their expertise in using smart technology to interact with patients (Godsey *et al*., 2020). Nurses need to be trained to use telemedicine and artificial intelligence in medical settings (Lv & Qiao, 2020; Nittari *et al*., 2020). Moreover, they must reinforce their skills in online corporate communication: mobile apps, social media, and online communities (Wu *et al*., 2019). These professionals can use mobile apps to educate patients on healthy habits (Piculell *et al*., 2021), they can manage social media to monitor patients (Farsi, 2021), and they can participate in online communities to share medical information about prevention and health education (Chen & Wang, 2021).

3. Methodology

Artificial intelligence, big data, telemedicine, social media, and mobile applications have transformed hospitals' corporate communication strategies. Hospitals manage these tools to make their brands more dynamic. To better understand how hospitals manage this process, we resorted to the World's Best Hospitals 2023, an international ranking published annually by *Newsweek* and *Statista*. Both organizations analyzed 2,300 hospitals from 28 countries. They considered four indicators: (a) 80,000 online surveys to doctors from 28 countries, (b) patients' opinions about hospitals, (c) hospitals' quality indicators, and (d) PROM questionnaires about patients' quality of life. Based on these results, they calculated each hospital's score and position in the ranking. To do that, they respected the following weights: online surveys to medical experts (54%), patients' opinions (14,5%), hospitals' quality indicators (29%), and PROM questionnaires (2,5%). Once they defined rankings, they confirmed these results with a Global Board of Medical Experts, including doctors from Israel, the United States, Germany, Switzerland, and France (Newsweek, 2023).

TABLE I: Brand Indicators

Homepage (Patients and society)	Online newsroom (Media companies)	About us (Public authorities, suppliers, and shareholders)	Artificial intelligence department (Employees)
1. Hospital 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 AI into medical protocols 3. Training employees 4. Research projects 5. Collaborations with universities or research centers 6. Collaborations with external technological companies

Thanks to this ranking, we identified the 140 best hospitals in the United Kingdom (see Appendix). To analyze how these hospitals managed different technological tools to implement branding initiatives, we considered several targets that we grouped into four main categories: (a) patients and society; (b) media companies; (c) public authorities, suppliers, and shareholders; and (d) employees. We focused on patients since they play a key role in every hospital's corporate communication strategies and because they influence other stakeholders' perceptions of the organization's brand (Chou, 2021). We included media companies in our analysis because these organizations contribute to reinforcing hospitals' scientific credibility as well as doctors' and nurses' reputations (Etheredge & Fabian, 2022). Concerning public authorities, these institutions influence hospitals' brands because they collaborate with hospitals for several projects, such as health education initiatives or public health campaigns (Odoom *et al*., 2019). Finally, we considered employees since they represent the hospital's brand and because they play a key role when hospitals build the brand in a collective way (Medina Aguerrebere *et al*., 2020).

From 17th August to 10th September 2023, we conducted a quantitative analysis of how the 140 best hospitals in the United Kingdom managed smart technologies to reinforce their brands. To do that, we defined 34 brand indicators that we grouped into four main categories according to stakeholders and platforms: (a) homepage (patients, society); (b) online newsroom (media companies); (c) about us (public authorities, suppliers, shareholders); and (d) artificial intelligence department (employees)—see Table I. We only considered hospitals' official websites. Finally, we resorted to the binary system to analyze each indicator.

4. Results

Most hospitals in the United Kingdom resorted to smart technologies to establish meaningful relationships with their stakeholders and build a more reputed brand. Indeed, 97,14% of hospitals had a corporate website. However, many hospitals can improve in different areas: online newsrooms, about us sections, etc. We present our results grouped into five main categories: (a) homepage, (b) online newsroom, (c) about us section, (d) artificial intelligence department, and (e) global performance.

4.1. Homepage

Our results demonstrated that all hospitals had a homepage, and most of them also proposed social media platforms (89.71%), interactive health libraries (61.03%), video consultations with doctors (60.29%), and virtual tours for patients (59.56%). However, few hospitals resorted to other tools, such as interactive maps (43.38%), mobile apps (41.91%), patient portals (30.88%), podcasts (8.82%), chatbots (1.47%) or symptom checkers (1.47%). On average, hospitals respected 4.98 criteria out of 11 applicable, and only six hospitals achieved 9 criteria: *Addenbrooke's*, *Warwick Hospital*, *Darent Valley Hospital*, *The Princess Margaret Hospital*, *Royal Stoke University Hospital*, and *KIMS Hospital*.

4.2. Newsroom

According to our results, 96.32% of hospitals managed an online newsroom where they mainly shared digital press archives (98.47%). However, most hospitals did not fulfill other criteria: B-roll videos (41.98%), interactive corporate reports (37.40%), interactive infographics (7.63%), news alerts (7.63%), podcasts (6.11%), online translation services (0.76%), online interviews with doctors (0,76%), online press conferences (0%), and mobile apps for journalists (0%). On the other hand, 67.94%

TABLE II: Hospitals' Artificial Intelligence Departments

	Hospital	Artificial intelligence department	Universities, Research centers	Technological companies
1	St Thomas' Hospital	Centre for innovation, Transformation and improvement		KHP Ventures, KiTEC, AI Centre, Clinical Scientific Computing, Clinical Engineering, KHP Biobank.
2	Guy's Hospital	Centre for innovation, Transformation and improvement		KHP Ventures, KiTEC, AI Centre, Clinical scientific Computing, Clinical Engineering, KHP Biobank.
3	King's College Hospital	London medical imaging and AI centre for value based healthcare	Imperial college London, Queen Mary University of London.	Wellcome EPSRC centre medical Engineering, Health innovation network, Siemens, IBM, Nvida, Ixico, Biotronics 3D, Mirada, Cedar Medical, Innersight, Brainminer, Ai Nostics, Kheiron. Perspectum Diagnostics.
4	Alder Hey Children's Hospital-Pediatrics	Alder Hey innovation centre		Hartree Centre, IBM, Microsoft.
5	Great Ormond Street Hospital for Children-Pediatrics	Digital research, Innovation and virtual environments	KPMG	Sensyne Health, Roche.
6	National Hospital For Neurology and Neurosurgery-Neurology	Brain Surgery with Robotics, Artificial Intelligence and Neuronavigation	Imperial College London, King's College London, University of Calgary, University of Edinburgh.	Medtronic, Artificial Bits, Olympus, VineHealth, Storz, Bbraun, Lightpoint Medical.

of hospitals respected between 2 and 3 criteria, and the only one achieving 6 indicators was *KIMS Hospital*.

4.3. About Us Section

Even if 98.53% of hospitals had an about us section, most of them did not comply with the indicators considered: interactive corporate documents (72.93%), videos (34.33%), interactive infographics (9.7%), suppliers' platform (0%), and shareholders platform (0%). On average, hospitals respected 2.16 criteria, and only 11 hospitals achieved 4 indicators: *East Surrey Hospital*, *Frimley Park Hospital*, and *Royal Derby Hospital*, among others.

4.4. Artificial Intelligence Department

Our results proved that only 6 hospitals had implemented an in-house department specializing in artificial intelligence. These six departments integrated artificial intelligence into the hospital's medical protocols, organized sessions to train their employees in this area, and conducted research projects in collaboration with external partners (see Table II). On the other hand, 40 hospitals had not implemented an artificial intelligence department, but they developed research projects about this area in collaboration with different external organizations (see Table III). Finally, 59 hospitals did not have an artificial intelligence department, but they had implemented research projects in this area that they managed without collaborating with any external company. Concerning the 35 hospitals remaining, they did not mention anything about artificial intelligence on their corporate websites.

4.5. Global Performance

After analyzing how the 140 best hospitals in the United Kingdom managed smart platforms to promote their brands, we can state that, on average, these organizations respected 10.68 criteria out of 34 applicable. Finally, the best hospital was *Alder Hey Children's Hospital–Pediatrics* (see Table IV).

TABLE III: Artificial Intelligence: External Companies

	Hospital	Universities and Research centers	Technological companies
1	University College Hospital	Cambridge University	Microsoft
2	Addenbrooke's	Cambridge University	Microsoft
3	Queen Elizabeth Hospital Birmingham	University of Birmingham, Massachusetts Institute of Technology.	Roche, Health Data Research UK.
4	Leeds General Infirmary		West Yorkshire and Harrogate Cancer Alliance, Densitas.
5	Frimley Park Hospital		Qure.ai, Canon Medical Systems.
6	Manchester Royal Infirmary		Rinicare, Medtronic.
7	Royal Free Hospital	University College London, Queen Mary University of London, National Institute of Health.	Abbott Cardiovascular
8	Glasgow Royal Infirmary		Scotland's Industrial Centre for Artificial Intelligence Research in Digital Diagnostics, Paige, Dynamic Scot.
9	Royal Berkshire Hospital		Brainomix, NCIMI.
10	Southampton General Hospital	Southampton Biomedical Research Centre	Engineering and Physical Sciences Research Council
11	Homerton University Hospital		Nuance
12	Queen Elizabeth University Hospital	University of Glasgow	Icaird, Canon Medical Research Europe, Philips.
13	Kingston Hospital		Siemens Healthineers
14	Southmead Hospital	University of the West of England	Bristol Robotics Laboratory
15	Musgrove Park Hospital		Sensyne Health, Google.
16	The London Clinic		Medtronic, Hyland Healthcare.
17	Chapel Allerton Hospital	University of Leeds	SerenusAI
18	Glenfield Hospital	University of Leicester	Medtronic, UK Space Agency.
19	Royal Bolton Hospital		Qure.ai, Allscripts, Vectra.
20	Bupa Cromwell Hospital		Visionable, Dell, Streets Heaver, Philips.
21	Basingstoke and North Hampshire Hospital		Accelerate Diagnostics
22	Poole Hospital	University of Kent	Philips, System C & Graphnet Care Alliance.
23	Northumbria Specialist Emergency Care Hospital		Microsoft, Wheelshare, Tyco Security Products, FloKi Health.
24	Heatherwood Hospital		Kier
25	Trafford General Hospital		Siemenes
26	North Tyneside General Hospital	Newcastle University, University of Warwick, Coventry University.	Medtronic, Crescendo.
27	University Hospital-Coventry	University of Barcelona, University of Warwick	Corporate Health International.
28	Golden Jubilee National Hospital	University of Glasgow	Canon, Stryker MedEd.
29	The James Cook University Hospital	National Institute for Health and Care Research	Olympus America, Alcidion, Ingenica Solutions, Canon Medical System.
30	Darlington Memorial Hospital		Philips, Intuitive Surgical.
31	Bradford Royal Infirmary	University of Bradford	GE Healthcare
32	Royal Hampshire County Hospital		GE Healthcare
33	University Hospital of North Durham		Philips
34	Sunderland Royal Hospital	National Institute for Health and Care Excellence	Medtronic, HIMSS Analytics Solutions.
35	Derriford Hospital	University of Plymouth	Brainomix, Nuance.
36	Torbay Hospital		Microsoft
37	Yeovil District Hospital		Intersystems, Deepmind, Google, Veracode.
38	Queen Alexandra Hospital	SWASH	Heartflow
39	Liverpool Heart and Chest Hospital-Cardiology		Aidence, iRhythm Technologies.
40	Royal Papworth Hospital-Cardiology & Pulmonology	University of Cambridge	

TABLE IV: Best Hospitals in the United Kingdom

Hospital	Number of criteria (out of 34)
Alder Hey Children's Hospital-Pediatrics	21
KIMS Hospital	19
Warwick Hospital	18
Royal Stoke University Hospital	17
Darent Valley Hospital	17
North Tyneside General Hospital	17

5. Discussion

Most British hospitals resorted to smart communication platforms to interact with their stakeholders and build their brand collectively. They interacted with different stakeholders such as employees, public authorities, and media companies; however, most of them focused their efforts on patients. According to Oxman *et al*. (2022), patients are opinion leaders influencing other stakeholders' perceptions about different topics, such as hospitals' services or doctors' behaviours. When hospitals interact with patients, they implement communication initiatives based on meaningful values such as knowledge, education, emotions, and social support (Wang & Wu, 2020). This way, hospitals help their doctors and nurses improve their relations with patients (Li & Xu, 2020). However, our results proved that the best hospitals in the United Kingdom can still improve. On their homepage, only a few hospitals proposed education tools such as patient portals (30.88%), podcasts about health promotion (8.82%), or symptom checkers (1.47%).

Hospitals collaborate with media companies to implement public health campaigns and reinforce citizens' skills in health literacy (Mheidly & Fares, 2020). Journalists have become social educators who contribute to building a healthier society (Kreps, 2020). That is why hospitals' doctors and nurses actively collaborate with them (Reza *et al*., 2022). Despite these facts, our results demonstrated that most British hospitals did not prioritize media companies as a main target. That is why, on their online newsroom, only a few hospitals provided media companies with different tools, such as b-roll videos (41.98%), interactive corporate reports (37.30%), or interactive infographics (7.63%). Besides, no hospital proposed an option to organize online press conferences to facilitate journalists' tasks.

Hospitals implement branding processes to build the brand in a collective way along with their stakeholders (Medina Aguerrebere *et al*., 2020). These organizations mainly interact with patients and employees, but they should also collaborate with public health authorities to implement health education campaigns (Castiglia & Dettori, 2022). When hospitals include all stakeholders in their branding processes, they can build a reputed brand (Adebesin & Mwalugha, 2020). Nevertheless, our quantitative analysis proved that most British hospitals can still improve in this area. Indeed, on their about us sections, no hospital proposed a platform for suppliers or shareholders. Besides, most hospitals were very conservative concerning the content shared with these targets: they mainly focused on the hospital's history and annual reports. These organizations should provide shareholders, suppliers, and public authorities with different contents, such as the hospital's social projects or digital strategies for the next years.

Artificial intelligence, big data, and telemedicine have radically transformed hospitals, as well as doctors' and nurses' professional practices (Burr *et al*., 2020). Thanks to smart technology, these professionals develop new skills and improve their patients' medical outcomes (Rickert, 2020), which positively affects their personal brand reputation (Zhang *et al*., 2021). However, our results demonstrated that only 6 hospitals out of 140 had implemented an artificial intelligence department where employees were trained in this area. On the other hand, only 46 hospitals collaborated with external organizations to implement artificial intelligence projects. British hospitals could reinforce these collaborations to accelerate their digital transformation, help employees understand how to use this technology, improve patients' medical outcomes, and reinforce the organization's reputation.

This paper aimed to analyze how the best hospitals in the United Kingdom managed smart platforms to reinforce their brand. Even if we prove some important facts that will help hospitals hone their online branding strategies in the next years, we must highlight three main limitations. First, we did not analyze each hospital's corporate communication plan, which prevented us from understanding the role of smart platforms in their branding processes. Second, we could not find any paper evaluating stakeholders' perceptions of hospitals' online branding initiatives, which made it difficult for us to evaluate the true impact of these platforms. And third, we did not find any article that analysed similar topics, which is why we could not compare our results with other countries or organizations. We recommend that researchers interested in this area should focus their efforts in the next years on the following topics: how to integrate smart technologies into the hospital's medical protocols, how to train

doctors and nurses on the professional management of smart platforms for branding purposes, and how to quantify the impact of online branding initiatives on the hospital's scientific credibility.

6. Conclusion

Artificial intelligence, big data, telemedicine, mobile applications, and social media platforms have led hospitals to redefine their internal and external processes, as well as their corporate communication strategies. Integrating technology, medical protocols, and corporate communication constitutes a priority for hospitals interested in building a reputed brand. To efficiently do that, they need to redefine their relations with stakeholders. This paper aimed to analyse how the best hospitals in the United Kingdom managed smart technologies (websites, online newsroom, about us section, artificial intelligence department website) to interact with different stakeholders (patients, media companies, suppliers, shareholders, public authorities, and employees) and collectively build the organization's brand. After analysing this area from a qualitative and quantitative perspective, we propose three last ideas.

First, most hospitals in the United Kingdom mainly focused on patients (4.98 criteria out of 11 applicable) and not on other targets such as journalists (3.01/11) or public authorities (2.16/6). This decision can seriously damage these organizations' efforts to build a reputed brand since interacting with all stakeholders is essential to build a reputed brand. British hospitals should implement an integrated marketing communication approach considering several targets, platforms, and contents. Second, British hospitals should use smart platforms to implement new organizational processes with different targets and not only to disseminate corporate content. In other words, hospitals should establish processes that allow stakeholders to interact with hospitals in a different way: online press conferences (journalists), symptom checkers (patients), and smart platforms (suppliers, shareholders). Third, hospitals must develop digital transformation plans that establish how these organizations will use artificial intelligence to improve medical protocols, organizational processes, and branding initiatives. To do that, the first step consists of implementing an artificial intelligence department that leads this organizational change in a coordinated way.

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Conflict of Interest

The authors declare that they do not have any conflict of interest.

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Appendix

A. List of hospitals Analysed

1. St Thomas' Hospital
2. University College Hospital
3. Addenbrooke's
4. Guy's Hospital
5. John Radcliffe Hospital
6. St. Bartholomew's Hospital
7. Freeman Hospital
8. The Royal Victoria Infirmary
9. Chelsea and Westminster Hospital
10. Queen Elizabeth Hospital Birmingham
11. King's College Hospital
12. St Richard's Hospital
13. London Bridge Hospital
14. The Royal London Hospital
15. Salford Royal
16. Leeds General Infirmary
17. East Surrey Hospital
18. Wythenshawe Hospital
19. Worthing Hospital
20. Bristol Royal Infirmary
21. Hexham General Hospital
22. St Mary's Hospital
23. Frimley Park Hospital
24. Manchester Royal Infirmary
25. Royal Free Hospital
26. Glasgow Royal Infirmary

27. The London Independent Hospital
28. Royal Berkshire Hospital
29. Southampton General Hospital
30. Northern General Hospital
31. St Helens Hospital
32. Royal Derby Hospital
33. Homerton University Hospital
34. Royal Infirmary of Edinburgh at Little France
35. Royal Hallamshire Hospital
36. Royal Devon and Exeter Hospital (Wonford)
37. Hammersmith Hospital
38. Queen Elizabeth University Hospital
39. St George's Hospital
40. Nuffield Health-Leeds Hospital
41. Nottingham University Hospitals-Queen's Medical Centre Campus
42. Kingston Hospital
43. Queen Elizabeth Hospital-Gateshead
44. The Princess Grace Hospital
45. Royal Surrey County Hospital
46. University Hospital of Wales
47. St James's Hospital
48. Southmead Hospital
49. Stoke Mandeville Hospital
50. Musgrove Park Hospital
51. The London Clinic
52. Chapel Allerton Hospital
53. Whiston Hospital
54. Royal United Hospital
55. Tameside General Hospital
56. Conquest Hospital
57. Glenfield Hospital
58. Royal Bolton Hospital
59. Bupa Cromwell Hospital
60. Basingstoke and North Hampshire Hospital
61. Poole Hospital
62. King's Mill Hospital
63. The Whittington Hospital
64. New Cross Hospital
65. Harrogate District Hospital
66. Withington Community Hospital
67. Wexham Park Hospital
68. Royal Victoria Hospital
69. Northumbria Specialist Emergency Care Hospital
70. Heatherwood Hospital
71. Trafford General Hospital
72. North Tyneside General Hospital
73. Grantham and District Hospital
74. Nottingham University Hospitals-City Campus
75. Burnley General Hospital
76. Castle Hill Hospital
77. Clifton Hospital
78. St John's Hospital
79. Calderdale Royal Hospital
80. Crawley Hospital
81. The Alexandra Hospital
82. Luton and Dunstable Hospital
83. Southend University Hospital
84. Warwick Hospital
85. University Hospital-Coventry
86. Golden Jubilee National Hospital
87. Charing Cross Hospital

88. Princess Royal Hospital
89. Queen Elizabeth Hospital-London
90. The York Hospital
91. The James Cook University Hospital
92. Brighton General Hospital
93. Darlington Memorial Hospital
94. Cheltenham General Hospital
95. University Hospital of Hartlepool
96. The Royal Albert Edward Infirmary
97. Newark Hospital
98. Bradford Royal Infirmary (BRI)
99. Royal Hampshire County Hospital
100. The Wellington Hospital
101. Leicester Royal Infirmary
102. Queen Mary's Hospital
103. James Paget University Hospital
104. Epsom Hospital
105. City Hospital Birmingham
106. Broadgreen Hospital
107. University Hospital of North Durham
108. Eastbourne District General Hospital
109. Sunderland Royal Hospital
110. Chesterfield Royal Hospital
111. West Middlesex University Hospital
112. Darent Valley Hospital
113. St Peter's Hospital
114. Bassetlaw Hospital
115. The Princess Margaret Hospital
116. St Lukes Hospital
117. County Hospital Louth
118. Derriford Hospital
119. Royal Stoke University Hospital
120. Torbay Hospital
121. KIMS Hospital
122. Yeovil District Hospital
123. Queen Alexandra Hospital
124. Barnsley Hospital
125. Salisbury District Hospital
126. The Chiltern Hospital
127. Alder Hey Children's Hospital-Pediatrics
128. Birmingham Children's Hospital-Pediatrics
129. Bristol Royal Hospital For Children-Pediatrics
130. Churchill Hospital-Oncology
131. Great Ormond Street Hospital for Children-Pediatrics
132. Liverpool Heart and Chest Hospital-Cardiology
133. National Hospital for Neurology and Neurosurgery-Neurology
134. Queen Charlotte's & Chelsea Hospital-Maternity
135. Royal Brompton Hospital-Cardiology & Pulmonology
136. Royal Manchester Children's Hospital-Pediatrics
137. Royal Papworth Hospital-Cardiology & Pulmonology
138. The Christie-Oncology
139. The Royal Marsden Hospital-London-Oncology
140. The Royal Marsden Hospital-Surrey–Oncology