Integrated research model for web interfaces: toward a taxonomy of quantitative and qualitative analysis for digital native media

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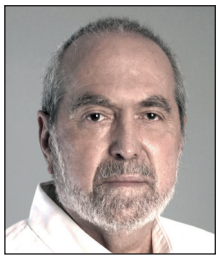

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Abstract

In a context marked by the emergence of new platforms and interfaces, digital native media face the challenge of organizing and presenting their content in an effective and eloquent way. This milestone requires ongoing work toward the identification and conceptualization of the dimensions that map the structural and formal requirements necessary for fluid communication with audiences and adequate visibility in the digital ecosystem. This study, which adopts a quantitative–qualitative methodological design, proposes, describes, and applies a taxonomy for the analysis of digital media web interfaces. Based on a review of the literature, two rounds of expert judgment, and a pilot test, the research identifies 14 thematic dimensions, 36 indicators, and 69 variables. The study focuses on the importance of renewing research about taxonomy related to structural dimensions that address narrative, quality, usability, information search, and content redissemination and socialization, among other aspects. The study of web interfaces applied to journalism demands long-term research work with a holistic approach that, at a conceptual and practical level, can offer proposals for analysis and diagnosis on the basis of an integrated method.

Keywords

Internet; Web; Journalism; Digital journalism; Content; Communication; Interfaces; Digital; Slow journalism; Benchmarking; Indicators; Models; Taxonomies; Quantitative analysis; Qualitative analysis; Digital native media; Cybermedia; Narrative; Quality; Usability; Search.

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1. Introduction

The global communication ecosystem is giving increasing importance to digital native media. The migration of legacy media to the digital scene has given way to an explosion of new journalistic projects and developments conceived "from" and "for" cyberspace (**Salaverría**, 2020a). In this scenario, the study of the properties of their websites, conceived as the nerve centers of their communication strategy, constitutes an important area of study and research.

Although it has not been part of the mainstream of studies in digital journalism, understanding journalism from each era requires knowledge of its foundation, that is, the scenario in which it occurs. Thus, at various points, understanding journalism implied understanding the properties of printed publications (the written press), the spoken word (radio), or the moving image (television). Currently, the study of the digital platform (the media's website) thus becomes essential to understand the media, especially digital native media, and their dynamics (**Salaverría**, 2020b). Although it lacks a dominant role at the research level, previous work in the academic literature has dealt with this subject.

The study of "what are" ["*qué son*"] and "what are not" ["*qué no son*"] new media (**Cabrera-Méndez**; **Codina**; **Salaverría**, 2019) has become a recurrent line of research during the last decade (**López-García** *et al.*, 2022; **Salaverría**; **Martínez-Costa**, 2021; **García-Orosa**; **López-García**; **Vázquez-Herrero**, 2020). The classic studies of the particularities of multimedia, hypermedia with a special emphasis on links (**Landow**, 1995; 1997), or information architectures (**Wurman**, 1997) have given way in recent years to various studies about organic positioning in search engines, innovation in formats and narratives, business models, Big Data, or trends such as slow journalism (**Romero-Rodríguez**, **Tejedor**; **Castillo-Abdul**, 2021; **Le-Masurier**, 2015; 2016; **Zelizer**, 2009).

The study of links and thereby hypertextuality forms part of the class of works that have the digital as a focus of study and, therefore, as one of the genuine characteristics of online journalism (**Stroobant**, 2019). In that paper, Stroobant looks at hyperlinks as navigational cues that can guide users through the information available in the digital ecosystem. Specifically, Stroobant's study focuses on health journalism. This aspect is important because online media are frequently used and represent convenient sources of information on aspects that *Google* (2022, p. 11) calls "your money or your life." This study conducts an environmental analysis of search engine results pages for the term "health news." One of the findings highlights that native news websites have a tendency to provide more hyperlinks than legacy news websites do. A second result refers to the use of corporate hyperlinks, that is, links to sites or pages of the company or business group themselves, a trend that is more pronounced in legacy media. Although the study focuses on health news, the results about hyperlinking strategy remain significant in general.

The functional use of hyperlinks to external sources was also studied by **Humprecht** and **Esser** (2018). In this case, the authors categorize hyperlinks around three main functions they identify: increasing transparency, increasing understanding, and increasing the capacity for deliberation. This typology of links and functions allows for the design of digital media analysis based on the important functions in each case. The study of the hypermedia component, which connects with the media ownership, has required studies on new phenomena such as the use of clickbait, among other subjects (**Bravo-Araujo**; **Serrano-Puche**; **Novoa-Jaso**, 2021; **García-Serrano**; **Romero-Rodríguez**; **Hernando-Gómez**, 2019).

The relationship between website design elements and related usability elements has also been studied (**Kim**; **Jeon**; **Choi**, 2020). In this research, they analyze seven design elements that impact the usability of news media websites: advertisements, font, layout, volume of information, use of categories, use of color, and the way in which titles are presented, combining text and images. Although the study focuses on Korean media, the conclusions can probably be extrapolated, as their research concludes, among other things, that users prefer consistent layout designs throughout the site and at different levels, that titles are displayed next to a photo, that the depth of the category menu structure has a maximum of two levels, and that the links follow the usual blue color convention.

In a similar vein, **Al-Said** and **Al-Said** (2022) study the influence of news site design on information perception and recall. They conclude that interactive sites that combine different resources –images, video, and typography– to present news improve both the reception and recall of information.

A study by **García-Perdomo** and **Magaña** (2020) in which they interview managers of digital native media is focused on their perception of the drivers of their activity. The results rate the quality of the content and journalistic standards

highest, higher than the technology and the digital platforms themselves, which shows that, for some of these companies, innovation is not limited to technological aspects but rather to the ability to offer journalistic products and integrate users, although this last point is still considered very limited.

> Our study proposes a quantitative-qualitative design of descriptive scope with the aim of building, validating and testing a taxonomy for the analysis of digital media web interfaces

The role of SEO in newsrooms is also being progressively studied, as in the work of **Prawira** and **Rizkiansyah** (2018), who applied ethnographic methods and observed the role of organic SEO in the newsrooms of three Indonesian media outlets, which allowed them to see how the respective business cultures influence the adoption of SEO as part of journalistic routines.

In a similar vein, **Lopezosa** *et al*. (2020a; 2021) carried out research on newsrooms and concluded that, regarding the adoption of SEO as part of the strategies of the media, direct support from management is essential, as is the establishment of two tiers corresponding to the actions of the editors and those of the person in charge of the global SEO strategy. Likewise, **Lopezosa** *et al*. (2020b) propose an integrated system of indicators to analyze and measure the SEO of media that for use by scholars or practitioners.

In turn, **Seyser** and **Zeiller** (2018) propose the portmanteau "scrollytelling" to designate certain longform articles in journalism. Specifically, scrollytelling, as these authors define it, is a format that uses extensive narrative texts and multimedia content, and they draw a conclusion about the essential role of infographics in these kinds of what they call complex stories.

In addition, data journalism is often considered one of the best resources in digital journalism because of its well-known ability to help readers understand complex phenomena. **Plazas** (2019), after analyzing a sample of the best cases of data journalism from the *Malofiej Awards*, categorizes up to six modalities of vision, which he calls the visualization of events, of hidden problematics, of places, of narratives, of subjectivities, and of convergences.

In the search for innovation, newspaper companies have opted to merge newsrooms and have set up labs for new formats, such as virtual reality. **Vázquez-Herrero**, **Negreira-Rey**, and **López-García** (2019) propose that innovation in digital media can be studied through four dimensions: the use of multimedia narratives, data journalism, virtual reality or 360° video, and fact-checking. They add a fifth dimension that involves identifying the media that have been equipped with a lab. They conclude that the models are unstable and that the search for a model that is sustainable, through a combination of technological and human resources, can provide everything necessary to ensure their consolidation in the digital environment. In addition, several authors, such as **Pérez-Seijo** (2021), have studied the use of immersive video in digital native media.

The so-called i-docs, web docs, or interactive documentaries are undoubtedly a genuinely digital form of innovation in journalism. Although i-docs combine contributions from film documentaries and video games, they are an area in which the journalistic approach of taking a critical look at current affairs is fundamental. In this sense, the work of **Dowling** (2022) consists of the analysis of how the i-doc in US productions has evolved since 2015 to focus, above all, on the principles of transparency, social responsibility, and commitment to truthfulness, thus configuring i-docs as an empathetic alternative to traditional news coverage work.

In a similar vein but focusing in this case on interactive multimedia productions, **Van-der-Nat**, **Müller**, and **Bakker** (2021) examine what they call the "architecture of interactivity", focusing specifically on the analysis of the navigation systems of some specific cases of such productions. In their study, they identify structures with varying degrees of sequential and open trajectories, with the latter providing the most agency to users.

An original approach to the treatment of digital news comes from the study by **Kulkarni** *et al.* (2022). In their work, these authors explore structures other than the inverted pyramid to analyze users' reception of these structures. They conclude that audiences consider structures that are more linear and narrative, rather than the inverted pyramid, to be more attractive, as they can better convey content.

The case study is applied again in the work of **Peña-Ascacíbar** and **Álvarez-Peralta** (2021). Specifically, they analyze common characteristics (such as societal structure) and differential characteristics (paywalls and ethical codes), as well as the trajectory of the Spanish digital native media outlets *El confidencial*, *ElDiario.es*, and *infoLibre*. In their study, the authors also evaluate the main digital network metrics, although they conclude that the latter data are not a good predictor of membership as identified by the number of followers.

Regarding recent protocols applied to the analysis of specific aspects of digital journalism, **Santos-Hermosa**, **Lopezosa**, and **Codina** (2022) analyze interactivity in the digital press, focusing their study specifically on parameters and indicators related to user experience and user interaction options related to the characteristic dimensions of digital media such as the media-user relationship, user-generated content, the user-user relationship, and content personalization options.

In the work of **Tejedor** *et al*. (2020b), the business models of various Ibero-American digital native media are analyzed. The findings include a trend toward business models based on diverse and "hyper-specialized" content as well as those targe-

ting "micro-audiences." In addition, the research identifies a clear interest in what the authors call horizontality, participation, and user engagement. The study emphasizes the need for native media to diversify their sources of income.

Romero-Rodríguez, **De-Casas-Moreno**, and **Torres-Toukoumidis** (2016), in turn, ask how to evaluate and assess the informative quality of digital media. Specifically, they look for convergences between academics and practitioners, with the aim of identifying "areas and dimensions of digital media news quality in terms of objective or quantifiable values" ["*áreas y dimensiones de la calidad informativa de los medios digitales en función de valores objetivos o cuantificables*"] (pp. 1-2). Among other results, they present a "taxonomy of dimensions of information quality" ["*taxonomía de dimensiones de la calidad informativa*"] (pp. 3-4), obtained both from a review of the scientific literature and from a three-way Delphi analysis. The research ends by proposing a structured model to analyze the information quality of digital media.

Meanwhile, **Romero-Rodríguez** and **Aguaded** (2017) propose a model for analyzing the quality of media information by using structured categories and dimensions to evaluate the quality of information, also taking into account aspects of the "macro-environment of the journalistic environment" ["*macroentorno del entorno periodístico*"] (p. 12). The research concludes that political polarization and the discourse of social confrontation have a direct impact on the quality of news products. It should be noted that this research focuses on print media, but the scope of its proposals can be applied to journalism in general with few changes, which is why it is included in this literature review.

The digital context should not lead us to forget that the essence of journalism, in any format, is investigative journalism, which can be approached through various formats, with the case of slow journalism being very significant. Against this background, **Romero-Rodríguez**, **Tejedor** and **Castillo-Abdul** (2021) conducted a case study in which 12 examples of slow journalism media in Ibero-America were reviewed. The research focuses on the thematic axes, content, esthetic elements, and funding sources, concluding that their content can be considered "elitist," at least in comparison with conventional digital media, which reduces their ability to attract both subscriptions and advertising and increases their dependence on international cooperation.

Another way of analyzing the quality of digital native media is proposed by **Rodríguez-Hidalgo**, **Rivera-Rogel** and **Romero-Rodríguez** (2020). In their work, they use a taxonomy of evaluation dimensions of news quality that include news sources, uses of international agencies, and content review. In addition, they consider ideological plurality in their opinion and other pieces.

The aspect of media visibility, although it tends to attract less academic interest than professional interest, also has notable research. In the case of **Lopezosa** *et al*. (2021), the authors present a system of analysis for media visibility through the use of search engine positioning tools from a set of research studies. The authors propose a system called *AVCIS* (*Análisis de visibilidad de cibermedios con indicadores SEO*), which integrates a set of metrics for analyzing the visibility of digital media into a single protocol.

On a more abstract level, researchers in the field of the study of digital resources proposed a system of analysis (**Codina**; **Pedraza-Jiménez**; **Guallar**, 2016) centered on a group of operational concepts presented through terminological units and integrated through a group of articulated elements that determine "the what" (parameters) and "the how" (indicators). This proposal, although based on developing analysis protocols for digital media that do not necessarily have to be media outlets, is a meta-protocol since its objective is to help develop particular systems of analysis for each case. Previously, part of the same group (**Codina** *et al.*, 2014) proposed the *SAAC* (*Sistema articulado de análisis de cibermedios*) protocol that was more focused on digital media analysis, of which the *SAAMD* (*Sistema articulado de análisis de medios digitales*) was an extension. These proposals have been applied in subsequent studies focused on a wide range of topics, such as the work of **Tejedor** *et al.* (2020a) on the websites of the most important hospitals in Latin America.

Although not forming a dominant research line, a wealth of studies have adopted mainly theoretical and operational approaches in the form of different sets of metrics or indicators to analyze various dimensions of digital media, in some cases, only digital natives, and in others, without making this distinction.

This panorama indicates the need to address a comprehensive treatment of how the quality of digital media can be measured or evaluated, particularly in relation to the platform. In the past, both the professional and academic sectors had shared constructs and evaluation criteria for assessing the quality of print media. On the basis of these examples, a systematic study of the literature, and consultation with experts, we propose herein a model for the integrated study of web interfaces using a mixed methodology to enable a diagnostic, analytical, and descriptive evaluation of digital media content and platforms.

2. Materials and methods

The study proposes a quantitative–qualitative design of descriptive scope with the objective of constructing, validating, and testing a taxonomy of analysis of digital media web interfaces. To this end, first, an exploration of the literature on methods and models for the evaluation of media and channel was carried out, providing raw material for an initial theoretical matrix of fields, dimensions, and integrated indicators. This first stage made it possible to draw up an initial matrix of elements related to quality, usability, and the search for information, combining a total of 14 thematic dimensions, 36 indicators, and 69 variables for consideration in the construction of the proposal (Table 1).

Table 1. Matrix of fields, dimensions, indicators, and variables derived from the literature review

Field	Dimension	Indicator	Variable
Quality	Form of content and narrative	Narrative model	Immersive/transmedia Conventional/pyramidal Mixed Other
		Multimedia and hypermedia	Conventional videos and photographs Augmented videos and images, 360°, virtual reality Hyperlinks and interactive architecture (i-docs, animations, gamification, newsgames) Other
	Journalistic genres and styles	Conventional genres	News item, interview, report, chronicle, review
		Specialized genres	Literary, cultural, travel, technology
		Investigative genres and slow journalism	Major stories, documentary, exposé
		Data journalism	Infographics, illustrations, and data visualization (DatViz) Open statistical data (dataset and interoperability) Complete statistical information (sample, dates, error)
		Opinion genres	Articles, columns, editorials, mastheads, political cartoons, blogs, and vlogs.
	Headlines	News headlines Clickbait Top title and summary	
	Metadata of the news stories	Metadata	Date and time of publication Name and surname(s) of author(s) Authors' bio and email or link to their social network Identification of institutional or corporate authorship Name and surname in credits of photo, illustration, or infographics Name and surname in credits of photo, illustration, or infographics Statistics (metrics) of the news story (unique accesses, readings, average reading time)
	Transparency, truthfulness, and validity of content	Fact-checking systems and procedures	
		Transparency and readers' ombudsman	Clear societal structure Ethical codes Information and legal form Sources of financing and transparency portal (subsidies, advertising, subscriptions, crowdfunding, cooperation agencies, sale of copies, etc.). Ombudsman, letters to the editor
	Related content	Link to content related to the information inside or outside the media	
	Content curation	Search engines and collection, filtering, and selection systems	
Usability	Noninvasive reading	Ads/advertising (layout)	Layout of advertising spaces that do not disrupt the reading or comprehension of the news stories or the home page
		Cookie information, subscriptions, and terms and conditions	Layout of legal notices that do not disrupt the reading or comprehension of the units Information or home page
	Interface layout	Content layout	Blog layout Layout of printed newspaper Transmedia integrations and interactive blocks
	Legibility of content	Font (stylography)	
		Volume of information	
		Use of subheadings and dividers	
	Readers–media–authors interaction	Readers' comments section in the feedback for each news story	
		Readers' votes (like/dislike) section for each news story	
		Content sharing buttons	*Twitter*, *Facebook*, *Instagram*, *LinkedIn*, *WhatsApp*, *Telegram*, email, copy link
		Possibility of communication between readers and authors	Authors' email and/or *Twitter* accounts
	Content customization	Ability to request a newsletter	
		Content syndication via mobile, app, or web	
		Content recommendations based on users' browsing cookies	

Field	Dimension	Indicator	Variable
Search for information	Web browser	Search engine	Simple search, using *Google* or *Bing* Simple search, using the media outlet's website Advanced search (filters, categories, tags)
	SEO and visibility	SEO metrics (domain authority [DA] and page authority [PA] in *Moz*), metadata, taxonomies, visibility index (*Sistrix*)	

Subsequently, two rounds of expert judgment were conducted, the first for construction and content validity and the second for the assessment of the weights of each dimension in an effort to fix the taxonomy.

To validate the applicability of the model, a pilot test was applied to 10 Ibero-American digital media outlets, selected for their geographic diversity as well as position in international rankings and directories. The sample, designed to be a geographically representative portion of the Ibero-American digital media community, was selected to test the analysis approach presented in Table 2.

The corpus for analysis was selected by intentional or nonprobabilistic convenience sampling since a heterogeneous sample or a sample with maximum variation is required to test the usefulness of the model (applicability test) and determine its usefulness in different environments. In this regard, several inclusion criteria, such as geographic diversity, year of creation, and interface characteristics, were chosen.

The unit of analysis has been Ibero-American digital media focused on the production of various types of journalistic content that have appeared in the last 15 years, during which many new journalistic developments have occurred (**Zuluaga-Trujillo**; **Gómez-Montero**, 2019). This study thus applied the constructed analysis matrix to 10 digital media outlets that appeared between 2009 and 2020. This deliberate or judgmental sampling enabled the test or pre-test to incorporate media from different countries, years of creation, and characteristics. For this purpose, we used the media directory made by the platform *SembraMedia*, which includes 1,104 Spanish-language digital media outlets in 24 countries. *https://directorio.sembramedia.org*

This directory, created by a nonprofit organization, maps the digital media ecosystem in Ibero-America and has been cited in more than 150 articles and research papers. The test was carried out between June and August 2022.

Table 2. Digital media analyzed in the pilot test

Number	Medio	Country	Creation	URL
1	*GK*	Ecuador	2011	*http://gk.city*
2	*Eldiario.es*	Spain	2012	*http://eldiario.es*
3	*El surtidor*	Paraguay	2016	*https://elsurti.com*
4	*Efecto Cocuyo*	Venezuela	2015	*http://efectococuyo.com*
5	*Acento*	Dominican Republic	2011	*http://acento.com.do*
6	*Periodismo de barrio*	Cuba	2015	*http://www.periodismodebarrio.org*
7	*Conexión migrante*	Mexico	2016	*https://conexionmigrante.com*
8	*La silla vacía*	Colombia	2009	*http://lasillavacia.com*
9	*La brava*	Bolivia	2020	*http://revistalabrava.com*
10	*LadoB*	Mexico	2011	*http://ladobe.com.mx*

The first tool was developed using theoretical constructs. That is, based on an exploratory review of the scientific literature, we extracted those dimensions, indicators, and variables that were included in previously validated tools related to information quality, media transparency, and the analysis of web platforms and interfaces (Table 1).

This tool went through a first round of expert judgment, understood as an intersubjective knowledge-building technique of people who, by their knowledge and expertise in a field, contribute by separately assessing and evaluating a proposal (**O'Haggan**, 2018). In this sense, expert judgment consists of "asking a number of people who judge an object, tool, or material, or give their opinion on a specific aspect" ["*solicitar a una serie de personas que juzguen un objeto, instrumento o material, o que den su opinión sobre un aspecto concreto*"] (**Cabero-Almenara**; **Llorente-Cejudo**, 2013, p. 14), being closely associated with the Delphi technique (**López-Gómez**, 2018; **Mengual-Andrés**; **Roig-Vila**; **Blasco-Mira**, 2016).

The experts were selected on the basis of competence and expertise, as well as their self-assessment with respect to the selected objectives, a method proposed by **Cabero-Almenara** and **Barroso-Osuna** (2013) and **López-Gómez** (2018). The determining aspects for the selection included:

- Experience as a teacher and researcher for more than 10 years in digital media, platforms, and interfaces
- Recent publications (less than 3 years) on digital media, platforms, and interfaces
- Members of research groups with recognized prestige and track record in the field of digital media for more than 10 years.

A total of 15 experts participated in the first round, of whom only 12 were considered suitable (self-assessment) to make an objective judgment. They were sent a PDF document with the theoretical constructs tool (first version[1]) and also a survey consisting of Likert scales from 1 to 5 (1, strongly disagree; 5, strongly agree) for each dimension and its indicators within the primary model. Also, the experts had a space for each dimension in which they could make observations about that dimension or its indicators. The results of this first round are presented in Table 3.

Table 3. Results of the first round of expert judgment: theoretical constructs

Indicator	Median (M_E)	Fleiss' kappa (*k*)	Asymptotic standard error	*p*-Value
Dimensions presented (general–articulated)	5	0.725	0.33	1.24
Form of content and narrative	5	0.628	0.35	1.22
Journalistic genres and styles	5	0.621	0.28	1.28
Headlines	5	0.700	0.36	1.26
Metadata of the news stories	4	0.538	0.39	1.22
Transparency, truthfulness, and validity of content	5	0.616	0.29	1.28
Related content	5	0.658	0.33	1.24
Content curation	5	0.525	0.29	1.28
Uninterrupted reading	5	0.608	0.28	1.21
Interface layout	5	0.856	0.19	1.03
Legibility of content	5	0.902	0.11	1.01
Reader–media–author interaction	5	0.616	0.29	1.28
Content customization	5	0.658	0.33	1.24
Web browser	5	0.608	0.28	1.21
SEO and visibility	5	0.525	0.29	1.28

The study uses Fleiss' kappa (*k*) as an indicator of interobserver agreement when there are more than two evaluators. According to **Landis** and **Koch** (1977), Cohen's kappa can be interpreted as follows: < 0.20 indicates poor agreement, 0.21-0.40 indicates fair agreement, 0.41-0.60 indicates moderate agreement, 0.61-0.80 indicates strong agreement, and 0.81-1.00 indicates very strong agreement. In this regard, as seen in Table 1, all the concordances (*k*) of the theoretical indicators showed moderate (0.515) or very strong (0.902) agreement, whereas the median –as a measure of the central position– of the Likert responses was between 4 (agree) and 5 (strongly agree).

Table 4. Results of the second round of expert judgment: weighting by dimension and indicators

Field	Dimension	Median (M_E)	Relative weight	Weighted average*
Narrative	**Value for the field**	9.5	21.43%	10
	Form of content and narrative	9.0	36.99%	4
	Journalistic genres and styles	7.3	30.12%	3
	Headlines	8.0	32.88%	3
Quality	**Value for the field**	8.2	18.41%	8
	Metadata of the news stories	7.5	18.22%	1
	Transparency	8.2	19.82%	2
	Truthfulness and validity of content	9.5	23.08%	2
	Related content	7.8	19.02%	1
	Content curation	8.2	19.82%	2
Usability	**Value for the field**	9.5	21.43%	10
	Uninterrupted heading	8.2	23.54%	3
	Interface layout	8.5	24.53%	2
	Legibility of content	9.7	27.87%	3
	Content customization	8.3	24.04%	2
Search for information	**Value for the field**	8.8	19.92%	9
	Web browser	7.3	46.30%	5
	SEO and visibility	8.5	53.69%	4
Redissemination of content and socialization	**Value for the field**	8.3	18.79%	8
	Interaction with new stories	8.3	49.40%	4
	Redissemination	8.5	50.60%	4

*A correction factor is applied to the weighted average to standardize the rubric and avoid decimals

Overall, the dimensions presented a median (M_E) of 5, a *k* equal to 0.725 (good), an asymptotic standard error of 0.33, and a *p*-value of 1.24. Although this confirms the construct and content validity of the initial model, the experts made various qualitative observations on the questionnaire that were considered appropriate to incorporate into a second version, while others were discarded. Among these observations, two unrelated experts observed that accessibility should be included in this analysis model. However, accessibility, being such a complex subject, is already part of numerous academic approaches and also has specific protocols and means of analysis, validated by the international community and international organizations. Thus, a second version of the tool[2] was developed, including two new dimensions (narrative and content redissemination).

> "We propose a matrix to analyze narrative, quality, usability, search for information, and redistribution of content and socialization"

In the second round of expert analysis, in which the questionnaire was sent only to the 12 experts who answered the first round, 10 experts participated. This time, the survey did not ask for the validation of dimensions and indicators –already previously validated– but rather a weighting (value) of each dimension and indicator with a score from 1 (lowest) to 10 (highest). This would provide a rating of the variables of the tools, as a rubric, which would allow a posteriori quantitative and qualitative evaluation of the digital media outlets. The results of this round are presented in Table 4.

3. Results

The study has yielded results at different stages or phases of the research. In this sense, Table 1, derived from the literature review on taxonomies or analysis models designed for the analysis of news websites or digital media platforms, has allowed us to identify three thematic areas of interest: quality, usability, and the search for information. Each of these is broken down into a total of 14 thematic dimensions, 36 indicators, and 69 variables, which are detailed in the aforementioned analysis sheet (Table 1). Based on this, the incorporation of two rounds of evaluation and review by experts enabled the creation of a matrix that expanded the main thematic areas to five: narrative, quality, usability, the search for information, and content redissemination and socialization. These, in turn, include a proposal that encompasses 16 dimensions (Table 5).

Table 5. Proposed taxonomy for the analysis of digital media web interfaces

Field	Dimension	Range
Narrative	Form of content and narrative	Diversity of formats and proposals Application of innovation in the creation of content
	Journalistic genres and styles	Type and variety of journalistic genres and styles included in the medium
	Headlines	Type and features of headlines (approach, wording, and use of teasers)
Quality	Metadata of the news stories	Use of keywords in the labeling of the content presented
	Transparency	Identification of sources, resources, and other aspects Presentation of the organizational chart
	Truthfulness and validity of content	Support in sources: diversity of references used
	Related content	Access to related thematic content that enable a deep dive into the subject
	Content curation	Verification, editing, and quality control work
Usability	Uninterrupted reading	Presentation of content and communication with users without the inclusion of advertising or invasive content
	Interface layout	Physical design of informative messages
	Legibility of content	Adaptation of messages for screen-based enquiry
	Content customization	Option of customizing the digital media content
Search for information	Web search engine	Actions and tools designed for the (internal/external) search for content
	SEO and visibility	Organic positioning in search engines and content visibility strategies
Redissemination of content and socialization	Interaction with new stories	User–content–media communication options through different actions (liking, forwarding, commenting, commenting, rating, etc.)
	Redissemination	Dynamics of content dissemination on other platforms for dialog, especially social networks

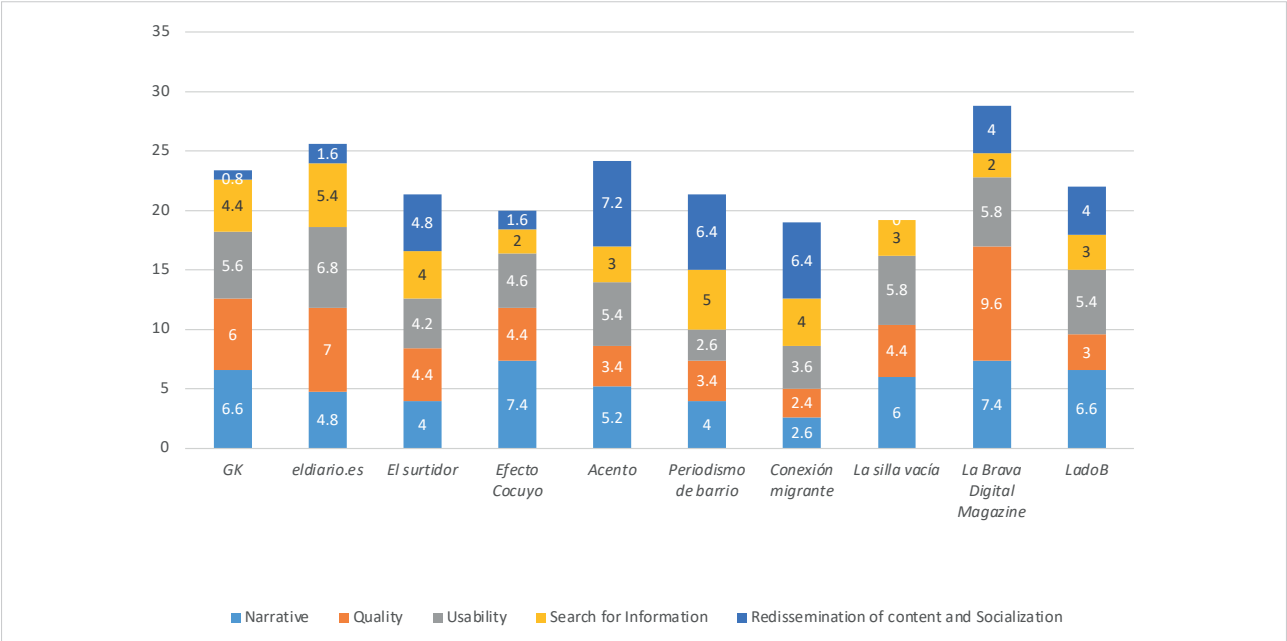
The applicability of the model was tested through a pilot test with 10 Ibero-American digital media outlets. The following are the results derived from this application, organized according to the five main thematic areas of this model (narrative, quality, usability, the search for information, and content redissemination and socialization). This testing was carried out with a descriptive quantitative-qualitative design. Table 6 quantifies the presence of the different elements in the set of digital media tested using a Likert scale ranging from 0 (absent) to 5 (very present) and its reconversion to the value for each dimension.

Table 6. Results of the quantitative application of the model in the pilot test

Field	Dimension	*GK* (Ecuador)	*Eldiario.es* (Spain)	*El surtidor* (Paraguay)	*Efecto Cocuyo* (Venezuela)	*Acento* (Dominican Republic)	*Periodismo de barrio* (Cuba)	*Conexión migrante* (United States)	*La silla vacía* (Colombia)	*La brava* digital magazine (Bolivia)	*LadoB* (Mexico)
Narrative	Form of content and narrative	2.4	2.4	1.6	3.2	1.6	1.6	0.8	2.4	3.2	2.4
	Journalistic genres and styles	1.8	1.2	1.2	2.4	1.8	1.2	0.6	1.8	2.4	2.4
	Headlines	2.4	1.2	1.2	1.8	1.8	1.2	1.2	1.8	1.8	1.8
Quality	Metadata of the news stories	0.6	0.8	0.6	0	1.0	0	0	0	5.0	0
	Transparency	1.6	2.0	0.8	1.2	0.4	2.0	1.0	1.6	1.6	0.8
	Truthfulness and validity of content	1.6	2.0	1.2	1.6	1.2	1.2	0.8	1.6	1.6	1.2
	Related content	0.6	0.6	0.6	0.4	0	0.2	0.2	0	0.2	0.2
	Content curation	1.6	1.6	1.2	1.2	0.8	0.8	0.4	1.2	1.2	0.8
Usability	Uninterrupted reading	1.8	2.4	1.2	1.2	1.8	1.2	1.2	2.4	1.8	2.4
	Interface layout	1.2	1.2	0.8	1.2	0.8	0.8	0.8	1.2	1.2	1.2
	Legibility of content	1.8	2.4	1.8	1.8	2.4	0.6	1.2	1.8	2.4	1.8
	Content customization	0.8	0.8	0.4	0.4	0.4	0	0.4	0.4	0.4	0
Search for information	Web browser	2.0	3.0	2.0	1.0	1.0	3.0	2.0	2.0	1.0	1.0
	SEO and visibility	2.4	2.4	2.0	1.0	2.0	2.0	2.0	1.0	1.0	2.0
Redissemination of content and socialization	Interaction with new stories	0.8	0.8	2.4	0.8	3.2	3.2	3.2	0	0.8	0.8
	Redissemination	0	0.8	2.4	0.8	4.0	3.2	3.2	0	3.2	3.2
TOTAL		**23.4**	**25.6**	**21.4**	**20.0**	**24.2**	**21.4**	**19.0**	**19.2**	**28.8**	**22.0**

The reading and interpretation of the results derived from the pilot test applied to the 10 selected digital media outlets was organized around the five thematic areas that structure the defined model: narrative, quality, usability, the search for information, and content redissemination and socialization (Graph 1).

As can be seen in Graph 1, there is a great deal of correlational variability among the results of each media outlet for each dimension. *Efecto Cocuyo* (Venezuela) obtained the best rating for the narrative dimension, whereas *La brava* digital magazine (Bolivia) obtained the best rating for the quality dimension. In terms of usability, as well as the search for information, the Spanish *Eldiario.es* scored better. In the case of content redissemination, *Acento* (the Dominican Republic) stood out above its Ibero-American peers.



Graph 1. Quantified results derived from the pilot test

3.1. Narrative

The analysis of the results derived from the dimensions related to the narrative shows a similar commitment to the media as a whole, especially in reference to the form of content, journalistic genres, and styles. The headlines, on the other hand, take a strictly informative approach in all cases, avoiding headlines that are flashy or that could be designed as clickbait.

The presence of graphic elements in the news pieces is very limited, as they are relegated to individual sections in most of the analyzed media, despite the fact that this is high-value content for accompanying, complementing, expanding, and enriching news pieces predominated by textual information. This aspect, framed in the narrative section of the proposed analysis table, opens an important reflection on the incorporation, from a protagonistic approach, of this type of content and resources.

There are, however, exceptions such as *El surtidor* from Paraguay, which designs graphics, tables, timelines, and other visual resources as "paragraphs" of the developed content and not just as complementary elements or additions that do not connect with the thread of the story presented by the content of the piece in which they have been inserted.

Figure 1. *GK. http://gk.city*

Regarding journalistic genres and styles, this pilot test identified that there is no clear indication of the type of pieces presented in the digital media as a whole. In some cases, however, such as the Ecuadorian media outlet *GK*, founded in 2011 and focused on in-depth journalism and social impact, it was observed that the content is organized from its home site or home page by means of bylines that allow the reader to anticipate what type of content they will find. This is a headline element that groups several pieces of information based on the type of journalistic genre. They are short or one-word expressions: "News" ["*Noticias*"], "Reports" ["*Reportajes*"], "Opinion" ["*Opinión*"], or "Trending" ["*En tendencia*"]. In addition, there are sections such as "More news, explained" ["*Más noticias, explicadas*"]. This distribution (Figure 1) makes it easier for the reader to identify and locate the different types of messages digital media display.

Figure 1. For its part, Cuba's *Periodismo de barrio* organizes its content on the basis of categories that blend genre type with the particularities of the platform. Thus, at the same hierarchical level and using the same graphic elements (typeface, color, and font size), "Latest articles" ["*Últimos artículos*"], "Topics ["*Temas*"]," "Podcast," "Illustrations" ["*ilustra-*

Figure 2. *La silla vacía. http://lasillavacia.com*

Figure 3. *La brava. http://revistalabrava.com*

ciones"], "Images" ["*Imágenes*"], or "Gender manual" ["*Manual de género*"] are mentioned. In addition to the above, one can find products such as that of *La silla vacía* from Colombia, which opts for very creative section names ("The empty chair" ["*La silla vacía*"], "The full chair" ["*La silla llena*"], "The academic chair" ["*La silla académica*"], "The chair –courses" ["*La silla cursos*"], "Super friends" ["*Super amigos*"], or "Sunday edition" ["*La dominguera*"]) that, therefore, may make it difficult for the user to anticipate the type of journalistic genres they contain (Figure 2), whereas other media outlets such as *La brava* from Bolivia opt for a more conventional structure (Figure 3).

Social networks are a resource used by various media outlets to report on different topics. The inclusion of pieces derived from other platforms, especially *Twitter*, *YouTube*, or *Instagram*, is a recurring element in all the media studied. The application of the model of analysis, therefore, enables a dual diagnostic and descriptive work that, thanks to link journalism, makes it possible to identify the platform ecosystems and synergies of digital media on their own and other platforms. The case of the Venezuelan media outlet *Efecto Cocuyo* is a good example of this type of material coming from both primary sources and other journalistic pursuits (Figure 4).

Figure 4. *Efecto Cocuyo. http://efectococuyo.com*

Fig*El surtidor*, a Paraguayan digital media outlet, stands out for its graphic design focused on the use of caricatures, mastheads, and illustrations with a clear commitment to innovation in formats and content. This media outlet, winner of the *Gabriel García Márquez Journalism Award* in 2018 in the Innovation category, opts to breathe new life into stories with both their approach and their presentation, that is, the "what" and the "how" (Figure 5).

3.2. Quality

The proposed taxonomy has made it possible to analyze the quality on the basis of the presence of metadata in the news stories, the support for (varied and numerous) news sources, and the content curation process at a formal and stylistic level.

It is worth noting that the pilot test found that very few digital media outlets recommend or link other content, whether their own or others', in their news pieces. This aspect is limited, in most cases, to the use of keywords or tags, not taking advantage of the navigational capabilities of hyperlinks and the possibilities they offer when it comes to delving deeper into a topic.

Figure 5. *El surtidor.https://elsurti.com*

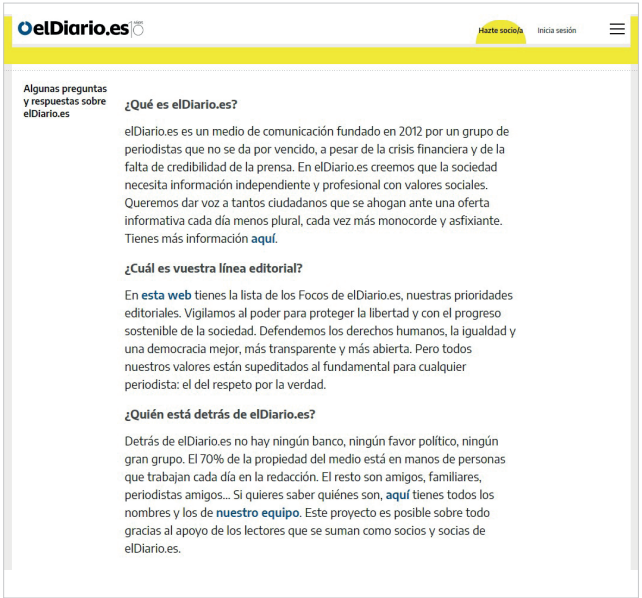


Figure 6. *Eldiario.es. http://eldiario.es*

> The study of the digital platform (the website of the media) is essential to understand the media and its dynamics, especially native digital media

In terms of transparency, in general, all the media outlets analyzed had sections dedicated to introducing the members of their respective teams, their profiles, and the means of contacting them. This information was also enriched using data related to economic balance, income, or potential sources of financing. The case of *Eldiario.es* from Spain is undoubtedly a paradigmatic element owing to the effort it makes (Figure 6) to offer detailed information about the media outlet, its editorial line, the entities that support it, its economic situation, and other information aimed at promoting transparency between the digital media outlet and society as a whole. In September 2018, on its sixth anniversary, this newspaper company published its official accounts with a detailed report of its revenues, expenses, and profits.

Colombia's *La silla vacía* is also an example of transparency owing to its disclosure of its structure, operation, organizational chart, and economic aspects. It showed the rates for each advertising package in detail, while precisely stating its sources of income and its partners, as well as how they invest their resources.

Incidentally, the Cuban media outlet *Periodismo de barrio* also stood out for its commitment to transparency. On its platform, together with a section entitled "Financial transparency" ["*Transparencia financiera*"], it includes a section called "Code of ethics" ["*Código de ética*"], which presents information about the principles that define the media outlet; aspects related to the "integrity, independence, responsibility, commitment and confidentiality" ["*integridad, independencia, responsabilidad, compromiso y confidencialidad*"] of the project; financing; coverage, research, and relationships with said sources; the writing, editing, and publication of content; photography and audiovisual components; the dissemination of publications and interaction with users, their use of *Creative Commons* licenses; and the digital media outlet's code of ethics, among other things.

3.3. Usability

Regarding the usability component, the application of the model of analysis identified that the selected media outlets are at the same level, with the exception of some that present a content layout that is somewhat invasive, as the layout makes it difficult to read some pieces on screen. Readability is, however, an element that was achieved in all cases, with nuances that differentiate them. Content personalization is one of the general weaknesses shown by the 10 digital media outlets studied.

In this dimension encompassed by the usability of the platforms, the Dominican media outlet *Acento*, winner of the *National Digital Journalism Award* in the category of Best Digital Native Newspaper, stood out for tagging their content very extensively, especially in association with their pieces. In this way, the reader can access other related content. However, this proposal for a hypermedia roadmap is not very sophisticated, since it uses keywords to generalize themes and topics that sometimes correspond to very specific thematic areas.

The Ecuadorian media outlet *GK* stood out for its short-form content accompanied by images whose sizes end up impacting on usability and the interaction between users and content (Figure 7). This news project, which focuses on three thematic areas (gender, environment, and transparency), stood out for its use of bold type and links (especially external ones) –aspects that contribute to optimizing the adaptation of content to on-screen reading– in all its content. Other media outlets, such as *Eldiario.es* in Spain, *Periodismo de barrio* in Cuba, *La silla vacía* in Colombia, and *El surtidor* in Paraguay, hardly took advantage of hyperlinks in their news stories; at the same time, they avoid using bold type, both for the organic positioning strategy of the content and for usability and readability aspects on screen.

GK

NOTICIAS

¿Quién es Luz Elena Coloma, precandidata a la Alcaldía de Quito?

Luz Elena Coloma es una de las candidatas a la Alcaldía de Quito por el movimiento oficialista Creo. Te contamos quién es.

Karol E. Noroña - 30 de agosto del 2022

"Este es mi último día en la concejalía. Me voy, pero me voy a volver como su alcaldesa". Con aquellas palabras, Luz Elena Coloma, política y socióloga ecuatoriana, renunció a su cargo como una de las 21 ediles del Concejo Metropolitano de Quito, el 30 de agosto de 2022. El nuevo objetivo de Coloma es convertirse en la alcaldesa de la capital.

Coloma ha formalizado ya su candidatura a la Alcaldía de Quito. Será el rostro político que representará al movimiento político de gobierno, CREO.

Figure 7. *GK. http://gk.city*

3.4. Search for information

The search for information was centered in practically all cases on a generic search tool, located in the upper frame, generally in the right-hand portion of the information hub. In this sense, particular importance was not given to the implementation of filters or advanced searches, which are crucial aspects of journalistic documentation to receive results that are more selective and specific to the information requirements of the users.

With regard to organic positioning in search engines, simple actions, such as the use of bold font, links (internal or external), and an advanced process regarding the wording of the title elements, which would be of great value to enhance performance in terms of SEO positioning, were neglected.

The Cuban media outlet *Periodismo de barrio* is focused on the development of research about communities affected by natural disasters or found themselves in situations of great social and economic vulnerability. Together with the usual search engine, it offers a list of thematic categories that, in addition to being used for content tagging, plays an important role in the identification and retrieval of content when using the general website tool to search (Figure 8).

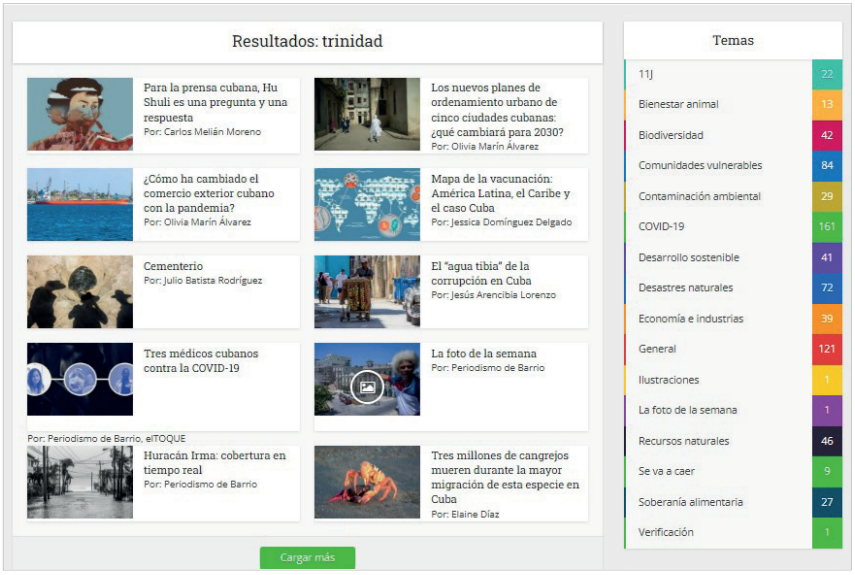


Figura 8. *Periodismo de barrio. http://www.periodismodebarrio.org*

3.5. Redissemination of content and socialization

The redissemination of content and the promotion of socialization is one of the dimensions that showed the greatest difference among the media outlets analyzed. Thus, the pilot test identified media outlets that did not provide any services in this regard, whereas others offered users the possibility of sharing content on social networks, reporting errors, and contributing content. In the case of the Ecuadorian media outlet *GK*, for example, there were no options for users to interact with the content for redissemination or socialization. The comment option is offered only after registration and is subject to a series of restrictive requirements.

4. Discussion and conclusions

Research on the characteristics of digital platforms used by digital native media is an area of growing importance, as highlighted by the various approaches and perspectives adopted by **Cabrera-Méndez**, **Codina**, and **Salaverría** (2019), **Salaverría** and **Martínez-Costa** (2021), **García-Orosa**, **López-García** and **Vázquez-Herrero** (2020), and **López-García** *et al*. (2022), among others. Just as it would have been impossible to study radio journalism without considering the properties of the audio medium, the study and understanding of journalism today requires ongoing and up-to-date studies on the digital media ecosystem. In this context, digital native media emerge as an object of study of great interest.

Accordingly, this research shows that studies centered around the particularities of digital media have focused on specific characteristics of the digital medium. Visibility or aspects linked to new formats have become increasingly important. This body of research provides valuable contributions to the necessary understanding of the digital medium, which, as this study indicates, is key. On this basis, the current research adopts a holistic method in an attempt to include all dimensions, without neglecting any significant ones. Therefore, the work presented herein offers researchers and professionals, especially digital native media entrepreneurs, a tool that, both conceptually and practically, provides a 360° view for the analysis and auditing of the quality of digital media, including aspects of visibility.

The designed methodology combines learning from previous work with expert judgment, by means of a two-round system and the application of stringent measures of levels of agreement, before finally testing the taxonomy with a pilot test (application test). This study thus presented a taxonomy of elements of analysis of the quality of digital native media websites that can be applied by digital media entrepreneurs and managers to improve their chances of sustainability insofar as they depend on the quality of their website to act as a media–user interface.

Moreover, the study is useful for digital journalism researchers who need to understand the digital native media of a country or a cultural area or a type of journalism, such as investigative or cultural journalism, among others, in terms of their adaptation to the digital context. This proposed taxonomy for the analysis of the elements of digital media aims to provide an element, from academia, to support the sustainability of journalism thanks to the possibility of better understanding the medium on which it is based.

> “To understand the journalism of each era is necessary to know its substrate, that is, the scenario where it develops”

5. Notes

1. Available at:
https://doi.org/10.5281/zenodo.6811157

2. Available at:
https://doi.org/10.5281/zenodo.6811176

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