



The Internet's potential: A study of Indian news sites

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ABSTRACT

The multifaceted online features of the Internet have encouraged traditional media to explore the novel possibility of the online market. In this context, our study examines how Indian newspapers have adopted online media features such as interactivity, hypertextuality, multimediality, immediacy, memory, personalisation, ubiquity, creativity, contextualisation, and other latest new media technologies. This analysis uses a methodological strategy formulated by Zamith to understand the extent to which Indian news sites incorporate the potentials of the Internet. Herzberg's "two-factor motivation-hygiene theory" was employed as a foundation to examine how Indian newspapers include features of the Internet that satisfy digital users. Our study finds that Indian news sites lag in utilising the full potential of the Internet.

Keywords: ***news sites, new media technologies, user satisfaction, Internet, Indian media, print media, online news***

INTRODUCTION

India has the second-highest number of Internet users (Internet World Stats, 2019), with over 570 million Internet subscribers and growing at 13% per year. The average digital user of India consumes 10 GB each per month, and this is expected to increase to 15 GB per month on average by 2024 (TRAI, 2019). The rapid growth of digital users and the media is seeing a rise in digital content consumption in tandem. The launch of 4G and 5G networks with upgraded bandwidths, increased focus of the India government on implementing “Digital India”, the popularity of social media sites, behavioural change of digital users, affordability of mobile phones, dropping data cost, tablet computers, and smart television are some of the evident reasons that have spurred traditional media to showcase their presence online (FICCI, 2019; ComScore, 2018; Roy, 2016). Globally, the news industry continues to reinvent itself to be relevant in the competitive digital world (Berganza, 2016). Contrarily, Indian newspapers are in a peculiar paradox due to the parallel growth of newspapers and digital media (Nixon, 2016; FICCI, 2017). Some print media have reduced the frequency with a focus on growing digital platforms in India (KPMG, 2018). On another note, studies anticipate that future online consumption will be fuelled by regional users (Zhang, 2017; Sabate & Mico, 2019; Ong & Chibundu, 2018).

The rapid advancements in digital technology has led the traditional media to embrace a number of potential features of the Internet; in particular “interactivity”, “hypertextuality”, and “multimediality” (Torres, 2004; Paul, 2005). Other scholars (Díaz, 2003; Alves, 2004) included “immediacy” as the fourth feature of the Internet, while others (Pavlik, 2000; Lopez, 2003) highlighted the “memory”, “immediacy” and “ubiquity” features of the Internet as a communication tool (Deuze, 2003; Zamith, 2008). All the mentioned features play a significant role in satisfying users' needs (Zhang, 2001). The upsurge of news media technologies poses challenges and opens up novel opportunities for traditional media organisations. In India, although the print media continues to remain profitable, the industry is acutely aware of the changing news consumption patterns of its younger consumer cohort (Rodrigues, 2010), and the 2019 FICCI report predicted that digital media will surpass print media by 2021.

It is significant to examine how newspapers in India are responding to digital advancements to satisfy users. This study adopted Zamith's (2008) methodological framework to analyse the extent two popular Indian news sites use the Internet's potentials and latest new media technologies. This paper incorporated Herzberg's two-factor motivation-hygiene theory as further theorised by Zhang and von Dran (2000) for web application. This theory argues that motivation-hygiene factors on the web environment help to retain users and generate user satisfaction. This study aims to provide insights on how two Indian newspapers— an English language and a local language newspaper—respond to the advancements of new media technologies and their inclination towards user satisfaction on the theoretical grounds of hygiene and motivation factors. Henceforth, the study intends to examine to what extent does the Indian print media utilise Herzberg's “motivation” and “hygiene” factors of the web environment, and to what extent have the Indian print media news sites utilised the Internet's potentials.

LITERATURE REVIEW

User satisfaction and Herzberg's two-factor motivation-hygiene theory

The shift towards convergence journalism is evident in the strategic implementation of motivating journalists to adapt to digital platforms (Yang & Ahmad Ishak, 2015; Menke et al., 2018; Chakraborty, Luqman, Satapathy & Ganguly, 2018). The contemporary interactive journalism demands newsrooms to technically and editorially upgrade to meet expectations of current digital users (Caswell, 2019). The digital user represents the hybrid form of mass communication who participate/contribute to the production and distribution of news content (Lee & Tandoc Jr, 2017).

Research shows that usability and satisfaction are the two main reasons users consume news online (Zulkafli, 2014). Sites that allow user-generated content such as content submissions and letters-to-the-editor create a positive notion and happiness among users (Tang, 2013). A satisfied user expects the same experience when he/she revisits the news site and enjoys interacting through comments (Kim, 2012). Similarly, entertainment-related content motivates users to read the story in detail (Kang, Lee, You & Lee 2013).

The relationship between human behaviour and technological advancements has been the focus of research studies for several decades (Markus & Keil, 1994). Herzberg's two-factor motivation-hygiene theory foresaw the kind of working environment/tasks that would lead to high performance, motivation, and satisfaction. Further, Markus and Keil (1994) asserted that some US online ventures underwent financial losses due to the non-use or underuse of technological advancements. They failed to develop certain design features that would help attract users, maintain interests, encourage revisits, and promote user satisfaction.

By incorporating Herzberg's two-factor motivation-hygiene theory, Lee (2006) found that new media technologies can alter the news production, consumption, and distribution process extensively. The hygiene factors are effective in attracting users, while the motivation factors can retain users for a longer duration (Zulkafli, 2014). Accordingly, Mueller and Mack (2003) suggested that web designers need to increase site functionality and quality of service to attract users. The availability of relevant information on home pages and user dissatisfaction (irritation or frustration) are two aspects that dominate the digital user's psychology (Lo, Lin & Hsu, 2016). Liang, Lai, and Ku (2006) also stated that services/features that recommend personalised content can reduce information overload and increase user satisfaction.

In another work, Zhang and von Dran (2001) hypothesised Herzberg's theory by comparing the job environment in an organisation with "task characteristics" on digital platforms. The scholars further argued that motivation and hygiene factors play a significant role in user satisfaction or dissatisfaction when consuming or engaging with content on digital platforms. The digital interface provides the environment to access and retrieve information as well as conduct tasks.

Zhang and von Dran (2001) systematically distinguished hygiene and motivation factors of web environment on the grounds of Herzberg's two-factor motivational-hygiene theory. The hygiene factors refer to first impression or general appearance, basic functions, requirements for doing tasks, feedback or response, access restriction, privacy and data confidentiality, credibility of owners, authority and availability of owners and navigation. The motivational factors, on the other hand, are information-seeking tasks, task completion, user control, knowledge or skills gained, and recognition by owners. Hygiene factors remain an essential component of sites, and the motivational factors play a critical role in attracting users to the site and maintaining their interests.

The potentials of the Internet

Across the world, news publishers have been using various strategies to engage with their audiences or users. Research on Slovenian news sites reveals that editors control the interactive modes of user engagement. Consequently, this restricts any new space for user dialogue and interactive communication (Crnic & Vobic, 2013). The Iranian news sites use only one-third of interactivity tools such as email, RSS feed, print edition, comment section, and search category. They adapt very few interactive features such as forum, chat room, and reporter email/blog (Bastani & Yazdi, 2014). A German start-up online media entity called Opinary invented the interactivity feature, which has interactive visual tools such as *pressekompas* and speedometer to change the way audiences share opinions (Proll, 2017). In contrast, new media producers in the USA prefer interactive features that allow users to interact with the content, but without the ability to influence it (Himelboim & McCreery, 2012).

Hyperlinks integrate elements of text, images, audio, and video (multimedia) (Sundar, 2000). It is convenient to use links to enhance the text by linking it to news sources/background information, or direct access to other documents. Hyperlinks have the strength to identify professional profiles, validate and contrast sources, contextualise information, contact, and update content with transparency (Lucio, 2012). The hypertext feature is utilised in various stages of the news collection process, such as gathering, selecting, and accessing information. It can offer a non-linear content navigation structure that requires the user's active participation (Yun, 2007).

Multimedia features enable the interweaving of videos, photographs, and audios, together with a layering of written narrative which provide many opportunities to enhance the user experience (Giles & Hitch, 2017). Users can recall the text version or photo/video along with abbreviated text more efficiently as compared to other forms (Kim, 2012). The online media of Argentina shadows global trends in its digital development which has evolved consistently through innovative multimedia and interactive formats (Vazquez, 2018). Steensen (2010) claimed that multimedia remains an underdeveloped asset of the Internet, and journalists are struggling to cope with this component.

The personalisation features of the Internet require “anticipating the relevant intent” of the user to increase benefits (Jackson, 2007). Personalisation tools such as profile search (identifies user datasets), *Taboola* (distributes sponsored content), and *Premise* (recommends social media platforms) help to engage high-quality users (Bai, 2017). Chung, Wedel & Rust (2016) argued that tracking users through personalised algorithm is better than allowing them to customise the news site.

Ownership, readership, and economics of newspapers and their sites

Users and advertisers continue to value the print media in some parts of Japan, Brazil, East Asia, China, and India (Villi & Hayashi, 2014). Nevertheless, the newspaper industry continues to reinvent itself to be relevant in the market continually threatened by the digital medium (Villi & Hayashi, 2014). Nowadays, users prefer to access a news medium which offers content 24/7 (Panwar & Khan, 2019). The most apparent barriers for adapting to the newer digital environment in India are cultural hierarchy, the deep-rooted belief that print media are fundamentally superior to digital journalism, lack of effective synergy between publishers and editors, and the lethargic behaviour towards latest technological advancements (FICCI, 2017; Bharti, 2019). More than a decade ago, scholars predicted that the newspaper would die out in the USA by the 2040s (Lambert, 2007). Contrarily, Indian traditional media organisations have been growing their brands by adding regional offerings in local languages to their advertisers (Balaji, 2017). However,

with the rapid growth of multimedia content consumption, digital literacy (Giles & Hitch, 2017), and news consumption on social media sites (Rodrigues & Nieman, 2017), the Indian print media are expected to make an aggressive appearance online with multi-digital services soon.

Past studies (Soffer & Gordoni, 2018; Olofsson, Weible, Heikkila & Martel, 2018) have examined some dimensions of news sites in India, such as deliberation of online users, the role of news sites in environmental issues, fake news and new media journalist. In another study, Chakraborty et al. (2018) developed a novel framework called *Samar* (new recommendation service) that automatically curates news by optimising recent, relevant, and diverse news stories for users. With regard to Indian-language machine translation, it does not look promising due to inadequate data and accuracy (Kumar, Premjith, Singh, Rajendren, & Soman, 2018). Further, some researchers developed a deep neural network-based mechanism to find comments relevant to any section or paragraph of a news story (Mullick, Ghosh, Dutt, Ghosh & Chakraborty, 2019) as Indian users often pass comments without reading the full news article.

Nevertheless, there appears to be a dearth of studies on the overall potential of the Internet utilised by Indian news sites and user satisfaction. This study fills the gap by analysing how *The Times of India* and *Vijayavani* news sites have tried to satisfy their users by utilising the potentials of the Internet. The current study analysed both news sites using Zamith's methodological framework and Herzberg's two-factor motivation-hygiene theory. This framework does not consider newer technological advances. Notwithstanding, it is suitable for this study as the adoption of the Internet potentials by Indian newspapers is still at its early stages—the latest news media technologies are analysed in a separate category. The details of the grid measurement framework are available under the methodology section.

METHODOLOGY AND ANALYTICAL FRAMEWORK

This study examined *The Times of India* (English) and *Vijayavani* (Kannada) news sites of India. The sample selection was based on the highest newspaper circulation in their respective languages (ABC, 2019). This study sheds light on the extent to which Indian news media sites incorporate potentials of the Internet. We also interviewed the digital editors of *The Times of India* (telephone) and *Vijayavani* (face to face) in January 2020 to understand how they perceive their digital strategies.

The Times of India is an English-language daily newspaper, owned by Bennett, Coleman & Co. Ltd. (BCCL) since 1892. Starting with print media, the company then ventured into television, radio and internet (timesofindia.com, CricBuzz.com, gaana.com, ETMONEY.com). It has had an online presence since 1996.

Vijayavani is a Kannada-language newspaper launched in 2012 and has seen a registered 262% growth within three years of its launch. Kannada is a regional language spoken in the Karnataka state in south India. It is owned and published by Dr Vijaya Sankeshwara, of the VRL group. VRL Group is a nationally renowned logistics and transport company. VRL Group launched vijayavani.net in 2015 and entered the Kannada television industry with *Digvijaya news 24x7* in 2017.

The data collected were analysed using Zamith's grid measurement and cross-analysis techniques. The grid helps to identify the difference between news sites and to determine whether Indian news sites utilise the full potential of the Internet. Schultz (1999) first introduced the construction of grid measurement in his study before it was improvised by Zamith (2008) to

analyse potentials offered by the Internet. His work revealed that German news sites utilise less than 23% of the Internet's potential. This study replicated Zamith's framework to analyse Indian news sites. It should be noted that Zamith's framework does not consider some of the more recent technological advances. However, the original features of the Internet are sufficient for this study because the Indian regional newspapers are still in the early stages of offering multi-platform services or products. The adoption of the latest new media technologies was analysed as a separate category. Zamith's framework has a score of 0 to 100 points. The study analysed nine main characteristics of news sites such as interactivity, hypertextuality, multimediality, immediacy, ubiquity, memory, personalisation, creativity and contextualisation. The framework also cross-analysed features such as hypertextuality, multimediality, immediacy, memory and personalisation.

News content were collected over a month in March 2019. The top six trending news stories on each site were used as the sample for the study. A total of 720 news articles was analysed. The study analysed the data on the home page and subsequent pages separately.

The score for each Internet feature was given depending on its minimum or maximum use. For instance, if a news site offers photo, it scores 1 point whereas a news site that provides slide shows scores 2 points. If a news site does not provide any of these features, it scores 0 point. The cross-analysis looked at features with more than one potential. For example, "news updates sent immediately to the computer" has two Internet features such as immediacy and personalisation. These features were then cross-analysed to comprehend whether the selected news sites use multiple Internet potential.

Table 1. Utilisation of Internet's features as identified by Zamith's grid

Internet features	Grid	Cross Analysis	Total Grid
Interactivity	25	-	25
Hypertextuality	20	4	24
Multimediality	12	12	24
Immediacy	12	7	19
Ubiquity	4	-	4
Memory	12	2	14
Personalisation	12	3	15
Creativity	3	-	3
Contextualisation	-	24	24
Total	100	52	152

Source: Zamith (2008)

Table 1 shows the allotment of scores to each feature of the Internet (Zamith, 2008). The study conducted a cross-analysis of some potentialities whereby the scores obtained in a particular area were added to the scores obtained in associated fields.

RESULTS

Tables 2 and 3 represent the consolidated results tabulated for both news sites. The scores were then converted to a percentage for better understanding of scores derived from Zamith's analytical framework. The first column of the table provides a list of nine Internet features. The second column offers the percentage obtained from each sub-feature of the Internet. For instance, the maximum score of the personalisation feature is 12. The five sub-features of personalisation contribute to the maximum score of personalisation. The third column offers the cross-analysis of features that have more than one potential. The fourth column (Grand total) provides the total score as the sum of the second (grid score utilised) and third column (cross-analysis utilised). The final percentage is the sum of total grid score utilised, and total cross-analysis utilised divided by total grid (mentioned in Zamith's framework). In both tables (Table 2 and 3), the letter 'H' indicates score for home page, and the letter 'S' indicate score for subsequent pages.

Table 2. Utilisation of the Internet's potential by *The Times of India* news site

Internet Features	Percentage Grid Score Utilised		Percentage Cross-analysis Utilised		Percentage Grand total	
	H	S	H	S	H	S
Interactivity	24%	8%	-	-	24%	8%
Hypertextuality	80%	35%	100%	0%	83.3%	29.16%
Multimediality	83.33%	50%	75%	0%	79.16%	25%
Immediacy	100%	100%	0%	28.57%	63.15%	73.68%
Ubiquity	0%	0%	-	-	0%	0%
Memory	75%	41.6%	100%	100%	78.57%	50%
Personalisation	50%	50%	0%	0%	40%	40%
Creativity	100%	100%	-	-	100%	100%
Contextualisation	-	-	83.3%	33.3%	83.3%	33.3%
	62%	41%	67.30%	23.07%	63.8%	34.86%

The Times of India explored 63.8% (on the home page) and 34% (on subsequent pages) of the internet features. It failed to utilise the ubiquity (0%) characteristic while hypertextuality, multimediality, memory, contextualisation are some of the features utilised more than 75% on the home page.

Table 3. Utilisation of the Internet's potential by *Vijayavani* news site

Internet features	Percentage Grid Score Utilised		Percentage Cross-analysis Utilised		Percentage Grand total	
	H	S	H	S	H	S
Interactivity	28%	28%	-	-	28%	28%
Hypertextuality	50%	25%	100%	100%	58.3%	37.5%
Multimediality	50%	16.6%	41.6%	0%	45.8%	8.3%
Immediacy	100%	83.3%	42.8%	28.57%	78.9%	63.15%
Ubiquity	0%	0%	-	-	0%	0%
Memory	100%	75%	100%	100%	100%	78.57%
Personalisation	8.3%	0%	0%	0%	6.6%	0%
Creativity	100%	100%	-	-	100%	100%
Contextualisation	-	-	58.3%	37.5%	58.3%	37.5%
	51%	36%	53.84%	15.38%	51.97%	34.86%

Vijayavani explored 52% (on the home page) and 35% (on subsequent pages) of the internet features. It did not use the ubiquity feature while hypertextuality and contextualisation each, received a 38% usage score. *Vijayavani* scored 8% for the multimediality category as it mainly depends on text- and photo-related news items.

Extent of Herzbergs' motivation and hygiene factors of the web environment utilised

This section used Zhang's theorised framework of two-factor motivation-hygiene (Herzberg) and Zamith's methodological framework to understand user satisfaction on *The Times of India* and *Vijayavani* news sites.

Zhang's feedback or response (hygiene factor) section is suitable for Zamith's interactivity feature category. Features such as chat, discussion forum, letter-to-editor displayed online, and user comment displayed online are part of this section. Results show that both news sites do not prioritise user interaction. The comment section is the only option which both sites offer to their users. Further, although *Vijayavani* has a comment section on the site, it does not display user comments. In contrast, users participate actively through the comment section in *The Times of India* site. On the other hand, *Vijayavani* utilises user polls on the home page as well as on subsequent pages but *The Times of India* lacks this feature on subsequent pages.

Features such as immediate display of user comment, chat room, and discussion forum with journalist are some features that can control user participation in Zamith's grid measurement tool. Hence, Ping Zhang's access restriction (hygiene factor) category was analysed in this section. The news site has the option of filtering user comments, and journalist participation in chat room discussions which allows them to exert some control over the users' deliberations. Results reveal that *The Times of India* requests users to login through Gmail or Facebook before they post comments. Nevertheless, *Vijayavani* does not have this feature which means users can comment anonymously.

Zhang's privacy and data confidentiality (hygiene factor) category was analysed under Zamith's interactivity section that offers contact details of journalists and news sites. The results show that both sites do not provide personal phone numbers of their journalists. *The Times of India* offers the official email address of the journalist/author. Other than these features, there is no other restriction for the users as well as journalists on the sites.

Zamith's multimediality and hypertextuality features were placed under the 'first impression' (hygiene factor) category listed by Zhang. The results show that the subsequent pages of *The Times of India* do use multimedia features such as photo, static infographics and minimal video content. Furthermore, it utilises hypertextuality features such as generic-related hyperlink, extra/intra-textual hyperlink to the related simultaneous article, related article archive, and chronology of the subject. However, dynamic infographics, audio content, hyperlink to the original document source, hyperlink to audio, infographics and slideshow/image gallery are not utilised in subsequent pages.

The *Vijayavani* news site uses text and photos extensively on subsequent pages. The home page has video and photo gallery options but fails to use features such as static/dynamic infographics and audio. Further, subsequent pages may cause user dissatisfaction as while users can see more text and photos for content, they may not stay for long due to the absence of a video/photo gallery to engage them. *Vijayavani* utilises 58.3% of hypertextuality features but not so much for audio, chronology of story, and infographics. This implies that *The Times of India* has an upper edge in utilising multimedia and hypertextuality features on its sites.

Basic functions/features (hygiene factor) are theorised applications in the web environment that can be likened to “working conditions”. Continuous updates, date and time of article, content in multiple languages, and uploads based on different time zones were some other features examined in this study. This study found that both sites update their content continuously except during night time. These sites also display the date and time of each article upload. However, features such as content in multiple languages and the uploading of content in different time zones are missing in both sites.

Other features examined were archives, search boxes, and tags as navigation (hygiene factor) options on sites. Both news sites use the archive option on their sites. *Vijayavani* provides an opportunity to access all of its content published since its establishment (2015). On the other hand, *The Times of India* restricts access to old content up to 12 pages. Both sites provide a single internal search option. However, users cannot find a search option when they scroll down *The Times of India* site. In contrast, *Vijayavani* has a user-friendly menu bar that appears at the top throughout even when the user scrolls down the page. However, both sites suffer from a lack of multiple search options on the site, which would help users navigate the site easily.

The credibility of owners/journalists/designers of site, and trustworthiness (hygiene factor) were analysed through features which increase the credibility of the news such as email ID of office/journalists/authors as listed by Zamith. This study found that *The Times of India* provides a general email address of the office and other journalists. This site has opted to provide selected updates by topic through email and RSS feeds for users, and the latest news pops up on the computer screen if a user enables the notification option. However, the *Vijayavani* news site does not utilise the essential personalisation features such as deep personalisation of the first screen, RSS feeds by topics, updates sent to different types of mobile devices and selected updates sent to email.

Some of the hygiene theory does not apply to specific categories of the Internet's features listed by Zamith. They are: web owners/designers' attitudes and perceptions as well as the authority and availability of owners/designers. All the motivation factors listed by Zhang also do not fit into Zamith's framework.

Extent of Indian news sites utilising the Internet's potential

Interactivity

The Times of India utilises two (24%) interactivity features such as user blog and user poll options on the home page. It uses only one (8%) interactivity feature which is immediate display of user comments on subsequent pages. The home page of *Vijayavani* (Kannada news site) obtained 7 points (28%) for utilising interactivity features such as general email address or contact, poll/survey linked to forums, immediate display of user comments and voting option. The same interactivity (28%) features are found in its subsequent pages. On the other hand, this study notes that features such as discussion forum, chat room, contact details of official sources, user survey, letter to the editor, user blogs, and voting options are fewer in both news sites.

Hypertextuality

The home page of *The Times of India* utilises 83% of hypertextuality features such as generic-related hyperlinks, hyperlink to related simultaneous news stories, hyperlink to news content archived, hyperlink to the chronology of the topic, hyperlink to related audio, hyperlink to associated videos, hyperlink to related infographics, hyperlink to the relevant photo gallery or slide-show. In contrast, its subsequent pages uses only 29.16% of features such as generic hyperlinks, intra-textual hyperlink to related simultaneous news content, intra-textual hyperlink to relevant news content archived, and intra-textual hyperlink to a chronology of the news subject.

The home page of the *Vijayavani* news site uses the majority (58.3%) of the hypertextuality features except for extra-textual hyperlinks to the detailed chronology of story, audio, and infographics. Along with other features, the subsequent pages of *Vijayavani* utilises (37.5%) of extra hypertextuality features (tags associated with each article) in comparison with the subsequent pages of *The Times of India*.

Results reveal that both news sites do not provide the hyperlink of the original document's source, intra/extra hyperlink of audio, video, infographics and photo gallery in their subsequent pages. However, both utilise more hypertextuality features on the home page compared to subsequent pages. Results also show that both sites prefer to upload multimedia content within their own sites (intra-hypertextuality). However, they borrow most of the multimedia materials from their parent television channels. For instance, *The Times of India* takes video footages from its *Times Now* television channel. *The Times of India* also provides extra hyperlink options for advertisements and e-commerce sections such as *Latest Gadgets*, *Bestseller*, *Coupons* and offers. It also displays hyperlinks for the group's other news sites and services. However, these sites do not display hyperlinks to the original document's source and uses minimally hyperlinks to audio and infographic features.

Multimediality

The home page of *The Times of India* incorporates 79.16% of multimediality features, in contrast to *Vijayavani* which only utilises 45.8%. *The Times of India* utilises all the multimedia features listed by Zamith except the dynamic infographics. On the other hand, *Vijayavani* does not use static/contextualisation infographics and audio elements. Results show that the news sites incorporate more multimedia features on home pages.

Results on subsequent pages show that *The Times of India* and *Vijayavani* news sites use text and photos as a primary multimedia element to update the news content on subsequent pages. Even though both news sites have television channels such as *Times Now* (*The Times of India*) and *Digvijaya* (*Vijayavani*) as the parent organisation, they have not used video or audio content on

subsequent pages regularly. *The Times of India* utilises 25% (photo, static infographics, and video) while *Vijayavani* uses only 8.3% (photo and static infographics) of the multimedia characteristics. Features such as slide shows, dynamic infographics, and audio features are also missing on both sites.

Immediacy

Immediacy features received the highest points and are used most effectively in all news sites. Immediacy features such as continuously updating news stories, explicit updates of a news story, date and hour of a news story and posting of new story at regular intervals such as four, eight, twelve, and sixteen hours later are used on both sites. These sites update their content continuously for election news coverage and 'live' cricket match updates. The Breaking news/ Latest news sections are updated with new content at least every 10-15 minutes while other sections such as technology, entertainment, lifestyle and opinion columns are less frequently updated.

Ubiquity

The ubiquity feature mainly focuses on news stories posted in one or more languages. *The Times of India* does not provide links to its sister sites in different Indian languages. Both sites present news content in their preferred language. Unlike other Kannada news sites (*Prajavani*, *Vijaya Karnataka*), *Vijayavani* does not have an auto Google translation option to change the entire site to a different language of the user choice.

Another characteristic of ubiquity is publishing content in different time zones. *The Times of India* follows the Indian Standard Time (IST) time zone, but *Vijayavani* does not provide this option.

Memory

The memory feature primarily checks the availability of archived news stories. The home page mainly focuses on the latest/breaking news and archived news categories are found on subsequent pages of both news sites. Results also show that both news sites have simple overall archive options. *The Times of India* provides 12 pages of archived news stories that have at least 55 news hyperlinks on each page while *Vijayavani* has 3,221 pages of news content, which carries two reports on each page.

Personalisation

The Times of India sends selected updates via email, RSS feeds by topics and personalisation of the first screen. It provides a notification-enable option, which allows news content to pop up on a user's computer screen. In contrast, *Vijayavani* utilises only some of the essential personalisation features such as deep personalisation of the first screen, RSS feeds by topics, updates sent to different types of mobile devices, and selected updates sent to email.

Creativity

or novel features under the creativity section. *The Times of India* uses new features such as weather forecast, link to web series, Live TV, link to sister sites, E-paper, a section for an E-commerce site, cartoons and mobile app download link. The subsequent pages of this site provide direct mail, print, and zoom in/out features. The comment section has an option to “like” or “dislike” and “reply” to fellow user's comments. This site also uses the meta-hyperlink option effectively.

Vijayavani modifies its logo during special occasions, to create a sense of belonging with users. Further, the site displays live updates of current trending news at the top of the news section. A link to the live stream of *Digvijaya* (parent TV station) is also made available through its YouTube channel.

Latest new media technologies

Results show that *The Times of India* and *Vijayavani* news sites have a presence on social media platforms such as Facebook, Twitter, YouTube, Live TV and utilise features such as mobile apps for different operating systems, direct mail, print, zoom in/out as well as promoted content through Taboola. However, the sites lack or do not have the latest technologies such as live video, Satellite news gathering (SNG), LiveU, Bambuser, virtual reality (VR), artificial intelligence (AI), scrollytelling, Bandito, wearable journalism, data journalism, VideoTweeter, chatbot, Article Video Robot and text to video creation.

Cross-analysis

According to Zamith, the multi-potentials of the Internet can be understood better with the help of six features: hypertextuality, multimediality, immediacy, memory, personalisation, and contextualisation. This section looks at the results of cross-analysis to understand the extent to which *The Times of India* and *Vijayavani* news sites utilise these characteristics.

The Times of India and *Vijayavani* utilise 100% of the “tags associated with each news article” (hypertextuality & memory) feature on their site. *The Times of India* (75%) and *Vijayavani* (50%) adopt more multimedia features such as audio, video, infographics, image gallery (multimediality & hypertextuality) on the home page. These sites incorporate 40% of the “user comments to articles immediately displayed online” (immediacy & interactivity) feature. Features like “general updates sent immediately to the computer” (immediacy & personalisation) and “user poll/survey” (contextualisation & interactivity) are available only on the *Vijayavani* news site. *The Times of India* (80%) and *Vijayavani* (50%) employ hypertextuality and contextualisation features on the home page, and subsequent pages, 35% and 25%, respectively. These sites successfully incorporate (100%) the “date and hour of each news article” feature on their sites (contextualisation & immediacy).

With regard to unutilised features, *The Times of India* and *Vijayavani* news sites do not utilise (0%) features such multimedia journalistic content (multimediality & interactivity), chat room with journalist's participation (immediacy & interactivity) and content in multiple languages (personalisation & ubiquity). *The Times of India* also fails to utilise features such as general updates sent immediately to the computer (immediacy & personalisation) and poll/survey linked to forum/background information (contextualisation & interactivity).

To summarise, the home of the pages of both sites utilise more features than their subsequent pages. However, the home page of *The Times of India* scored a higher percentage (63.80%) than the Kannada news site *Vijayavani* (51.97%). For subsequent pages, both sites scored equally (34.86%). Additionally, scores for individual features on both sites differ. Ubiquity (0%), interactivity (between 8% to 28%), personalisation (between 0% to 40%) are some of the features that scored the lowest. In contrast, features such as creativity, immediacy, and memory features gained the highest scores on both sites.

DISCUSSION

The findings reveal that the Indian news sites only partially use the hygiene factors on their sites. *The Times of India* and *Vijayavani* sites fail in using the “feedback or response” hygiene factors (chat room, discussion forum and letter to editor features displayed online) and instead utilise the and user poll options. This implies that perhaps the news sites deliberately want to avoid interacting with users to reduce the workload of journalists (DeAndrea, 2012; Chung, 2007).

Using the Herzberg theory as a benchmark, both sites do not restrict users from accessing their sites. Nevertheless, *The Times of India* only allows users to filter their comments. In contrast, *Vijayavani* does not display any of the user content, although a comment section exists. As such, it has the potential to create dissatisfaction among users and avoid deliberations on any issue.

According to García-Rosales and Abuín-Vences (2019), internal hyperlinks complements paragraphs without making the text longer by linking to full articles. Similarly, *The Times of India* and *Vijayavani* incorporate first impression (multimedia and hypertextuality) hygiene factors on their news sites successfully. *The Times of India* uses maximum features on their home page; satisfying and leaving a good impression among users.

The “basic functions/features” hygiene factor are only partly used by the studied sites. Features such as content in multiple languages and uploads based on different time zones are missing in both sites. The growing segment of digital consumers from rural India presents media companies with an enormous opportunity to serve differentiated and customised content in order to grow their market share (TRAI, 2019). News sites should also consider prioritising content in regional languages since Google claims that 97% of Indian online users prefer to consume content in their own local language (FICCI, 2019; Giles & Hitch, 2017; Kim, 2012). Thus the present study suggests uploading content based on multiple time zones which would help users of other parts of the world to understand the relevance of the news and immediacy of upload.

With regard to the “privacy and data confidentiality” hygiene factor, *The Times of India* provides the official email address of the reporting journalist for each news article which *Vijayavani* does not. This could be attributed to the news site protecting their privacy of their journalists.

In his study, Lim (2012) found that top stories, videos, audio, photos, graphics, and maps/charts are not often replaced regularly. In contrast, the news sites examined here upload their top stories frequently, every 4/8/12/16 hours. This indicates that both news sites strive to cater to users’ needs. These news sites also provide source documents to support the credibility of their content which satisfies the “credibility and trustworthiness of the owners/journalists” hygiene factor.

The “navigation” hygiene factor looks at access to archived (memory) news content and user-friendly menu bar. In this regard, both sites suffer from a lack of multiple search options, which would help users navigate the site easily.

The Times of India prioritises personalised features over interactivity. On the contrary, *Vijayavani* lags in using personalisation features. As *The Times of India* fulfils all requirements of interactivity and personalisation features, it has an upper edge over the *Vijayavani* news site. This indicates that *The Times of India* is more credible than the *Vijayavani* site.

Personal interviews with the digital editors of both sites reveal that organisational policy is one of the main reasons for not adopting features such as display of journalists’ contact details, chat rooms, and discussion forums. They believe that users can still express their

opinions/thoughts/criticisms on the official social media pages (Tang, 2013; Kang et al., 2013; Holton Coddington, Lewis & De Zuniga, 2015).

While both sites borrow video content from their parent television organisation, *Vijayavani* has an adequate multiskilled workforce to edit or produce multimedia journalistic content. Further, the Digital Editor of *The Times of India* stated that the site is in the initial stages of adopting personalisation features. Currently, they feed news content based on user location through Jio but are planning to incorporate artificial intelligence and sophisticated deep-personalisation features shortly. Additionally, *Vijayavani*'s Digital Editor admitted that deep personalisation with a user profile will lead to a paid subscription. However, *Vijayavani* opts to provide content for free. *The Times of India* displays links of sister news websites on its English site. Nevertheless, they are reluctant to publish the same news content in multiple languages (the ubiquity feature) in their site. Similarly, *Vijayavani* prefers to focus only on Kannada-speaking users.

From the economic, ownership and readership perspective, it is evident that Indian news sites generate considerable revenue through the traditional media (print and television) (FICCI, 2019). Further, the digital editors of these news sites admit that the readership of print media is growing at a steady pace in India. Despite this, the print media is expected to face real challenges in the near future should they fail to adopt new media technologies (Villi & Hayashi, 2014). It should be noted that the rise in mobile internet users opens up an enormous opportunity for news sites to explore the potential of online platforms (Sarma & Kumar, 2015). Further, Indian print media sites should include regional components in news and advertisements to engage with more online users (Balaji, 2017) and develop an effective synergy between publishers and editors (FICCI, 2017; Bharti, 2019). Additionally, existing digital news sites should also explore advanced new media technologies such as SNG, LiveU, Bambuser, 360-degree VR, AI, scrollytelling, Bandito, wearable journalism, VideoTweeter, chatbots and Article Video Robot.

CONCLUSION

Findings reveal that Indian news sites utilise minimal features of the Internet, as they prefer a linear form of dissemination of news stories. While features like ‘interactivity’, ‘personalisation’ and ‘ubiquity’ are underutilised, their digital editors are optimistic of increased utilisation in the future.

Based on Zhang’s (2001) motivation and hygiene theory of web environment, the findings show that the studied news sites adopted features such as first impression/ general appearance, navigation, basic function and requirement to do task while underutilising others such as feedback and response (interactivity), access restriction, privacy and confidentiality, and credibility of owner. This study suggests that these news sites should explore and adopt more user-centric features such as interactivity, personalisation, multimediality, creditability, and navigation features, which would help them attract and retain new users.

The home pages of the news sites incorporate more features than the subsequent pages. Further, the sites only utilise basic features such as text, photo, and video and not more advanced ones such as infographics, meta-text, customisation of text, live video and virtual reality. Accordingly, the present study recommends that multimedia features/content should be prioritised since FICCI (2019) reported that the consumption of multimedia content has increased drastically in India.

The Times of India and *Vijayavani* news sites benefit from being a part of media conglomerates. These sites can borrow content (text, photo, audio, infographics, video, live television streams) from their sister sites/entities. Digital news sites that have print media as a parent organisation can communicate news stories through texts and photos. Additionally, they have adopted and utilised some of the latest features or technologies (Live TV, mobile apps for different operating systems, direct mail, print, zoom in/out, content promotion through Taboola) to provide more appealing and engaging content. However, they are currently lagging in capitalising the ever-evolving and rapid technological advancements such as 360-degree VR, AI, scrollytelling, wearable journalism, Videotweeter and Article Video Robot.

As a comparison, Reliance Jio Infocomm which transformed the digital business landscape in India by offering fast (Jio Fiber) and low-cost data packages currently has 548 million subscribers (Raheja, 2019). Future studies could fruitfully explore further and validate these insights from the perspective of digital users. In addition, the impact of economic, social, and cultural factors on Indian news sites adopting newer technologies might prove to be another important area for further research.

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