# A Best-Worst Scaling based Evaluation for Indian News Websites

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*Abstract:* - Developments in the media industry in recent years compel media houses to improve their website quality with the goal of attaining a sustainable competitive advantage through online presence. Here, the author evaluates the website quality of leading digital news alternatives with the use of Best Worst Method. WebQual, a widely acknowledged model, has been used to identify the contextually relevant criteria for such a study. Additionally, using three news websites (NDTV, India Today and Times of India) an attempt has been made to illustrate the criteria based approach to discern key insights which can aid better designed websites.

*Key-Words:* - News Websites, MCDM, BWM, WebQual.

# 1 Introduction

Every sphere of our lives has been affected by the rapid expansion of internet and ICT technologies and it led to growth of online media. In contemporary times it is evident that journalism has quickly migrated to focus on online content and print media like newspapers are fast dwindling, [1]. When compared with print media online newspapers have several advantages such as – agility to report current information, quick and wide dissemination to a large set of audience, retrieval and archive contents, [2]. The study pursues two key objectives – 1) to identify the vital website aspects evaluated and rated by web users to evaluate a particular news website and 2) to present the competitive advantage of three leading online news portals (NDTV, India today and Times of India (TOI) on the key website attributes using the Best–Worst Method (BWM). This emerges as a fresh approach as there is a lack of studies which evaluate news websites alternatives using the MCDM (multi criteria decision making) approach. A systematic approach is followed and the findings are presented in the form of tables and figures which facilitates ease of understanding.

# 2 Identification of Criteria and Alternatives for News Websites

Three alternatives which featured amongst the top ten news websites were identified as – NDTV, India Today and Times of India (TOI).All of these are widely acknowledged as legacy brands in the field of media and journalism and now have a digital presence with their website. Therefore analyzing their web presence, presents for other similar players a sound base to assess and optimally position their own websites. In the past WebQual, [3], framework emerged as an apt tool to assess several dimensions of website quality and therefore forms the underpinning for this study. Eight dimensions as have been briefly discussed in Table 1 are a part of this analysis.

# 3 Methodology

Based on the process outlined by past researchers, [14, 15], a schematic representation of the process of BWM is outlined: (1) Defining the problem; (2) Respondents express the best and the worst criterion; (3) Respondents rate their preference of the best criterion over all other criteria; (4) Respondents rate their preference of all other

criteria over the worst criterion; (5) Computation of optimal weights; and (6) Computing the aggregated score of alternatives.

## 3.1 Data Collection

In this study the purposive sampling method was employed to collect data. The respondent profile was expected to 1) exhibit a likely disposition to regularly prefer to browse news online and 2) an ability and understanding to interpret survey questions and provide responses on several pair wise comparisons. As a first step a solicitation letter was distributed to prospective respondents. The URL of the online news website was provided. They were advised to browse the same for next 10 days and their consent was sought to participate in the survey. 16 respondents (eight male and eight female in an age from 24 years to 48 years) participated in the study. MCDM and BWM are meant to focus on the "quality of the information, [15]" and thus work on a smaller set of data. Steps 1 to 5 are replicated for each respondent. Thus this study which consisted of sixteen digitally literate respondents helped generate findings which could be deemed reliable.

# 4 Application of the BWM
## STEP 1 Defining the problem

The starting point is to understand and include the criteria which will be factored by web users about the online news portals. NDTV, India Today and Times of India were the three alternatives for this study. The assessment criteria are outlined in Table 1.

## STEP 2 Respondents express the best and the worst criterion

As a second step, the responses were sought on - "*which of the eight criteria is the most important for browsing news websites*?" and "*which of the eight criteria is the least important for browsing news websites*?" It is to be understood that the most important criterion is deemed as the best and the least important criterion as the worst. Table 2 and Table 3 present the responses. Information Fit-to-Task stood as the most noteworthy criterion. Findings reveal that respondents rated it best six times whereas 'response time' was rated best four times and so was 'trust'.

## STEP 3 Respondents rate their preference of the best criterion over all other criteria

In this step, the respondents compare all other criteria with the best and provide their rating on a scale of 1-9 and table 2 presents the results on the same. This vector is expressed as

$$A_B = (a_{b1}, a_{b2}, ......a_{bn}) \qquad (1)$$

"Here, $a_{bj}$ indicates the preference of the best criterion $B$ over the criterion $j$, $[14,15,18]$".

## STEP 4 Respondents rate their preference of all other criteria over the worst criterion

Next, table 3 presents the other to the worst vector. Respondents now provide their ratings on all other criteria in comparison with the worst criterion on a scale of 1-9. Equation 2 provides the mathematical expression on the same.

$$A_W = (a_{1w}, a_{2w},.............a_{nw}) \qquad (2)$$

Here, $a_{jw}$ indicates the preference of the criterion $j$ over the worst criterion $W$.

| Table 1 : WebQual Dimension | Description |
|---|---|
| *Trust* | Trust, "in relation to websites, is defined as consumers' confidence that any information entered into the website will remain confidential and that said information will be transmitted and stored in a secure fashion, [3]". Researchers [4] "suggest that it also includes "the faith that the information presented on the website is true and accurate". A digital consumer's trust is therefore an essential indicator of the quality of news websites. It will be an essential factor to build a repetitive site patronage. |
| *Visual Appeal* | Visual Appeal- "measures how aesthetically pleasing a website is to the consumer, [5]. Determining what is aesthetically pleasing is complicated: it ranges from the overall complexity of the website, and the layout of the interface, to how many ads and graphics are appropriate on a given page, [6, 7]". A news website needs to have a significant visual appeal to be competitive. Image, text, navigation, sponsored content have to be efficiently balanced to provide the right appeal and encourage patronage. |
| *Innovativeness* | Innovativeness is "the creativity and uniqueness of a site design, [3]". In case on news websites it could include novel ways to present news and information as well as personalized content based on browsing history. This could also include introducing newer methods for users to respond, comment, download or share a news item. |
| *Information Fit-to-Task* | This "is an amalgamation of information quality and functional fit-to task", [3]. In component form, information quality refers to the data's appropriateness for use or ability to meet the users' needs, [8]. According to [3] it may be defined as "... the information provided meets task needs and improves performance". Users need credible, timely, well structured and a diverse set of - information as news. This criterion seems highly relevant to assess news websites. |
| *Tailored Information* | "The ability for consumers to tailor the information displayed on a website to meet their needs is Tailored Information, [5]". It has also been understood as the ability to personalize information between the consumer and the website", [9]. Modern IT technologies are often put in place to arrange and deliver content in a personalized manner and this could prove to me an important aspect for online news readers. Also, a news website's ability to synthesize (and thus tailor) content from different sources and provide a holistic perspective could be an evident expectation of users. |
| *Response Time* | Response time (e.g. download time or download delay) is defined by, [10] as "... the time it takes for a web client to fully receive, process, and display files", and is ranked as one of the largest impediments to electronic commerce in their research. Slow response time can be an impediment to e-commerce and is strongly associated with website success, [11]". |
| *Intuitive Operations* | "Intuitive Operations could be thought of as making the webpage easy to navigate and providing intuitive options for available tasks, [3, 12, 18]". Digital consumers want less of cognitive load and the design and navigation should facilitate ease of browsing, searching or at time sharing news items |
| *Relative Advantage* | The benefit a particular website has over other similar sites of its competitors. "This criterion has been given attention by past researchers, [13]" in the e commerce domain, yet this is highly relevant for news websites too. If the users perceive a visible relative advantage a particular site has over others it would definitely strengthen its competitive position. |

**STEP 5** Computation of optimal weights
For this step, an attempt is made to minimize the maximum absolute differences$\left(\left|w_b - a_{bj}w_j\right|, \left|w_j - a_{jw}w_{wj}\right|\right)$ for all $j$ to compute the optimal weights of a criterion. As outlined by Rezaei [14], the minimization problem is stated as:

$$min\left[\max_j\left(\left|w_b - a_{bj}w_j\right|, \left|w_j - a_{jw}w_{wj}\right|\right)\right]$$

$$s.t. \quad \sum_j w_j = 1 \quad\quad (3)$$

$w_j \geq 0$ for all $j$

Based on the process outlined by by Rezaei [14] the equation (3) can be solved as a linear optimization model as explained below in (4)

min $\delta^L$
s.t.

$$\left|w_b - a_{bj}w_j\right| \leq \delta^L, \text{ for all } j$$

$$\left|w_j - a_{jw}w_{wj}\right| \leq \delta^L \text{ for all } j \quad\quad (4)$$

$$\sum_j w_j = 1$$

$w_j \geq 0$, for all j
The solution to equation (4) provides us the optimal weights$(w_1^*,)w_2^*,....w_n^*.)$ as well as the optimal value of $\delta^L$. $\delta^{L*}$ is the consistency ratio of the pairwise comparison as a part of the process undertaken by BWM. The optimal weights are presented in Figure 1. The highest weight is for 'Information Fit-to-Task' closely followed by 'Trust' and 'Response Time'. Relative Advantage is ranked lowest. $\delta^{L*}$ up to 0.459 is acceptable for studies with eight criteria, [16]. The average consistency ratio is 0.098, and no individual consistency values violated the maximum threshold.

**STEP 6 Computing the aggregated score of alternatives**
The study particularly seeks to decipher the competitive positioning of the chosen alternatives based on the ratings provided by the respondents. In this step respondents were to rate each alternative on each criterion on a scale of 1-9 where 1 refers to 'not competitive at all' and 9 refers to 'extremely competitive'. To make a valid comparison it was critical to normalize the score and therefore linear normalized approach is followed. Therefore each value is divided by their column-wise maximum value to obtain normalized scores. Then the multiplication of each of the normalized values by their respective weights is computed. A row wise total is thus obtained and the final priority score is computed as presented in table 5. The mathematical expression is as follows

$$Z_i = \sum_{j=1}^{n} w_j x_{ij}^{norm}$$

Here, Zi is the final priority value of the alternative $i$ and $x_{ij}^{norm}$ denotes the normalized values of the criterion $j$ under the alternative $i$. Overall, NDTV is the most preferred online news website, followed by India Today and then Times of India. However the mean scores do not indicate too much disparity and it indicates the alternatives are close competitors to each other. Furthermore, the aggregate priorities, the average of all respondents is calculated (Table 5). NDTV achieves the highest priority across all criteria. Thus, we can reflect upon the other two alternatives (India today and TOI). With respect to trust both score equally, for Visual Appeal, Information to fit task, Tailored information, Intuitive operations, Relative advantage India today scored higher than TOI. Figure 2 facilitates this understanding.

## 5 Discussion and Conclusion
Results of this study indicate that NDTV emerged as the post preferred alternative. If we were to reflect on the individual priorities of the respondents (Table 4) 15 out of 16 had NDTV as priority. However, a notable aspect is that all three alternatives stand close to each other NDTV (1.08), India Today (0.90) and TOI (0.85). In fact there is an insignificant gap between India Today and TOI. The answer to the difference in priority can be contextualized to the criteria ratings and optimal weights and are discussed ahead. Table 6 and figure 1 reflect the respective scores across the three alternatives on these criteria. NDTV has a clear advantage over the other two alternatives for Information Fit-to-Task,' Trust and Response Time while TOI is having a better score for Response

Time than India Today. For web managers of these and similar news websites the implications are clear. It is evident that web users do not want mental strain and in fact most of them want to balance their time and effort to seek information on current affairs and other significant interests in the form of well structured news items which are accurate and timely. Further, to gain credibility news content should not have a partisan flavor which builds trust and credibility. Various web optimization tools may be adopted to improve on the response time *and short news items* on *news in brief* kind of options may be introduced for users who want to economize on time. All three alternatives have similar ratings for intuitive operations. With respect to tailored information there is a clear difference between the alternatives with NDTV receiving the highest followed by India today and TOI. In case of visual appeal NDTV and India today have a similar rating while it is noticeably less of TOI. There are some universal factors which add to visual appeal such as- a clear uncluttered look with an evident presence of blank white space, balanced use of colour and patterns, right font choice and less of advertised content or sponsored content which inhibit readability. News websites users hold less importance for innovativeness and relative advantage which are perhaps less factored by web users for news websites in comparison for merchandise based retailing websites. Nevertheless, they are not to be neglected and Fig 2 demonstrates a difference between the alternatives on the same. In the contemporary tech environment there are several tools available for website managers which provide analysis not only for user profile etc for their site but also for competing sites for example Google analytics. "Google Analytics is the web analytics service offered by Google to track and report the website traffic, [19]". Site administrators who are authorized to use Google analytics to assess their site performance benefit from metrics such as – number and count of visitation, geographical location of users, most visited pages and articles etc. Web managers and site managers may design strategies around the key criteria such as – Information Fit-to-Task, Trust, Response time and Visual appeal and monitor the response using web analytical tools in a periodic and timely manner. This would help to optimally position the news website and augment its competitiveness.

India is the second largest (China being first) online news consuming nation in the world, [17]. There is a growing presence of news websites both from legacy brands and new players making this Industry fiercely competitive. Website administrators remain concerned about the strengths and weaknesses of their website and they would indeed benefit from a criteria based approach employed by the best worst method. Benefitting from the direction provided from this study, strategy development could lead to increase the competitiveness of the site and pave the way for monetization [20,21]. Respondents in this study were limited to 16 and were evident users of computers and therefore in future studies may be carried across a diverse set of consumers and possible inclusion of more criteria.

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**Table 2 : Best to others vector**

| Respondent | Best | TR | VA | IN | IFT | TI | RT | IO | RA |
|---|---|---|---|---|---|---|---|---|---|
| 1 | IFT | 3 | 4 | 6 | 1 | 2 | 2 | 3 | 5 |
| 2 | TI | 2 | 4 | 4 | 2 | 1 | 4 | 4 | 5 |
| 3 | TR | 1 | 5 | 4 | 2 | 2 | 3 | 3 | 4 |
| 4 | TR | 1 | 3 | 3 | 2 | 3 | 2 | 2 | 4 |
| 5 | IFT | 2 | 4 | 6 | 1 | 3 | 2 | 3 | 6 |
| 6 | IFT | 2 | 2 | 3 | 1 | 3 | 2 | 2 | 6 |
| 7 | RT | 2 | 4 | 4 | 2 | 5 | 1 | 2 | 5 |
| 8 | IO | 2 | 2 | 3 | 3 | 3 | 2 | 1 | 4 |
| 9 | RT | 2 | 3 | 2 | 3 | 3 | 1 | 3 | 3 |
| 10 | IFT | 2 | 5 | 4 | 1 | 2 | 2 | 3 | 4 |
| 11 | TR | 1 | 3 | 3 | 3 | 3 | 2 | 2 | 3 |
| 12 | RT | 2 | 3 | 3 | 2 | 2 | 1 | 3 | 4 |
| 13 | IFT | 2 | 4 | 5 | 1 | 2 | 2 | 2 | 4 |
| 14 | TR | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 |
| 15 | RT | 2 | 3 | 3 | 2 | 3 | 1 | 3 | 4 |
| 16 | IFT | 3 | 3 | 6 | 1 | 2 | 3 | 3 | 4 |

1 indicates equal importance and 9 indicates absolutely more important
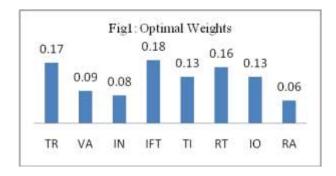TR = Trust,VA = Visual Appeal,IN= Innovativeness,IFT = Information Fit-to-Task,TI =Tailored Information,RT = Response
Time,IO = Intuitive Operations,RA = Relative advantage

**Table 3 : Others to worst vector**

| Respondent | Best | TR | VA | IN | IFT | TI | RT | IO | RA |
|---|---|---|---|---|---|---|---|---|---|
| 1 | IN | 3 | 4 | 1 | 4 | 2 | 2 | 3 | 5 |
| 2 | RA | 6 | 4 | 5 | 5 | 6 | 5 | 5 | 1 |
| 3 | IN | 7 | 4 | 1 | 6 | 6 | 6 | 6 | 3 |
| 4 | RA | 7 | 4 | 3 | 5 | 5 | 5 | 5 | 1 |
| 5 | VA | 4 | 1 | 2 | 6 | 5 | 2 | 3 | 4 |
| 6 | IN | 5 | 4 | 1 | 6 | 4 | 4 | 4 | 4 |
| 7 | T1 | 6 | 3 | 5 | 5 | 1 | 7 | 4 | 4 |
| 8 | IN | 5 | 3 | 1 | 5 | 5 | 3 | 3 | 4 |
| 9 | RA | 6 | 3 | 5 | 6 | 6 | 5 | 5 | 1 |
| 10 | RA | 4 | 3 | 3 | 6 | 5 | 2 | 3 | 1 |
| 11 | RA | 6 | 4 | 3 | 5 | 5 | 5 | 5 | 1 |
| 12 | VA | 7 | 1 | 2 | 6 | 5 | 2 | 3 | 4 |
| 13 | RA | 4 | 3 | 4 | 6 | 5 | 1 | 3 | 4 |
| 14 | TI | 7 | 3 | 5 | 5 | 1 | 7 | 4 | 4 |
| 15 | IN | 5 | 3 | 1 | 5 | 5 | 7 | 3 | 4 |
| 16 | VA | 5 | 1 | 2 | 7 | 6 | 2 | 3 | 4 |

1 indicates equal importance and 9 indicates absolutely more important
TR = Trust,VA = Visual Appeal,IN= Innovativeness,IFT = Information Fit-to-Task,TI =Tailored Information,RT = Response
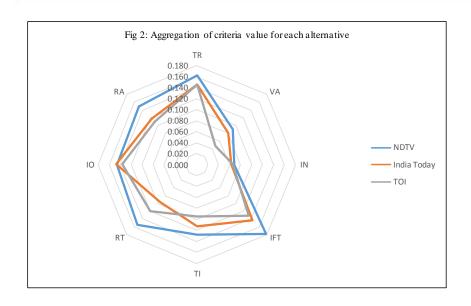Time,IO = Intuitive Operations,RA = Relative advantage


Fig1 : Optimal Weights

**Table 5  Priority of alternatives under each criterion (full sample aggregate level**

| News site | TR | VA | IN | IFT | TI | RT | IO | RA | Sum |
|---|---|---|---|---|---|---|---|---|---|
| NDTV | 0.163 | 0.092 | 0.069 | 0.178 | 0.127 | 0.154 | 0.146 | 0.150 | 1.079 |
| India Today | 0.145 | 0.080 | 0.062 | 0.142 | 0.112 | 0.096 | 0.148 | 0.117 | 0.902 |
| TOI | 0.145 | 0.047 | 0.064 | 0.132 | 0.095 | 0.120 | 0.136 | 0.109 | 0.849 |

**Table 4 Priorities  of alternatives (full sample)**

| Respondent | NDTV | India Today | TOI |
|---|---|---|---|
| 1 | 1.05 | **1.10** | 0.96 |
| 2 | 1.05 | 0.87 | 0.72 |
| 3 | 1.02 | 0.87 | 0.82 |
| 4 | 1.09 | 0.85 | 0.89 |
| 5 | 1.12 | 0.98 | 0.93 |
| 6 | 1.06 | 0.93 | 0.85 |
| 7 | 1.24 | 0.92 | 0.91 |
| 8 | 0.97 | 0.80 | 0.82 |
| 9 | 1.22 | 0.94 | 0.97 |
| 10 | 1.04 | 0.92 | 0.95 |
| 11 | 1.12 | 0.95 | 0.94 |
| 12 | 1.14 | 1.05 | 0.85 |
| 13 | 0.83 | 0.62 | 0.55 |
| 14 | 1.03 | 0.87 | 0.74 |
| 15 | 1.26 | 0.92 | 0.87 |
| 16 | 1.01 | 0.83 | 0.84 |
| **Mean** | **1.08** | **0.90** | **0.85** |



Fig 2: Aggregation of criteria value for each alternative