

Research Article

Developing and Validating a Multidimensional Scale for Digital News Trust: A Cognitive, Emotional, and Future-Oriented Approach

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ABSTRACT

As audiences move through an information environment that is governed by algorithms, can be accessed via multiple news sources, and is a space in which users constantly interact with information, this is an area of trust in digital news that has grown in significance. In an algorithmically-driven information environment, accessed through multiple news sources, and a space in which users constantly interact with information, this is an area of trust in digital news that has grown in significance. Although there are emerging studies on digital news trust, the current empirical tools for measuring trust have tended to emphasize cognitive assessments of credibility, and have given less consideration to emotional and future trust. Consequently, existing indicators offer only a partial picture of the formation of audiences' trust in digital news. To fill this void, this study designs and tests the Multidimensional Digital News Trust Scale (MDNTS), a single scale that combines the three types of trust, namely, the Cognitive Trust, Emotional Trust, and Future-Oriented Trust. The survey used a quantitative cross-sectional methodology, with 384 digital news users. The instrument was systematically developed, involving the identification of the instrument, the generation of items, the content validation by experts, and the empirical validation. Partial Least Squares Structural Equation Modeling (PLS-SEM) was used for data analysis, which was employed to check the psychometric properties of the adopted scale. The results show that the psychometrics of the MDNTS are excellent, with good reliability of indicators, internal consistency of the instrument, convergent validity, discriminant validity, and quality of the model. After investigation of the measurement model, an indicator with a low outer loading was deleted and a 15-item measurement model was obtained. The findings also confirm that Cognitive Trust, Emotional Trust and the newly operationalized Future-oriented Trust are three different but complementary facets of digital news trust. This study contributes to the previous research by developing and testing a multi-dimensional scale of digital news trust. The proposed MDNTS will serve as a valid tool for future research and will give media organizations a tangible way of assessing and enhancing audience trust in digital media environments.

1. INTRODUCTION

Digital communication technologies have changed in many ways, altering how news is produced, distributed, and consumed. It is the era of traditional journalism that has undergone a metamorphosis; today, information flows via websites, mobile apps, search engines, and social media instead of newspapers and television and radio. The shift has made news more easily accessible to the public and allowed audience members to actively engage in the dissemination, discussion, and evaluation of journalistic content. This has led to a change in the nature of digital journalism from a unidirectional flow of information to a more participatory model, where audiences are more involved than ever in visibility, interpretation and circulation of news [1-4].

But, with all these developments, the digital news environment has brought new hurdles to the issue of information credibility. News outlets and citizen journalists, influencers and independent content makers can spread information at the same time through the proliferation of online publishing platforms. This diversity has increased the availability of information, but it has also raised concerns about misinformation, disinformation, algorithmically curated content and information overload. This means that audiences often have to contend with conflicting information from various sources, making it harder to sort out good news from bad news. These trends have led to a loss of public trust in digital news and made "trust" one of the most pressing concerns of modern journalism [5-8].

In this context, digital news trust has become a key topic in communication studies. Trust determines whether an audience believes news to be credible, whether they continue to trust a specific news source, and whether they read, share and recommend news content. A range of factors beyond institutional credibility and professionalism in newsrooms, such as source credibility, platform attributes, user experience, emotional responses and faith in future newsroom behaviour, influences digital news trust. It is therefore no longer a rational appraisal of the accuracy of information, but rather a multidimensional concept that encompasses cognitive, affective and future-oriented processes [9-12].

Numerous theoretical models and measurement instruments have emerged to capture the concept of digital news trust, as this concept has become a topic of growing scholarly interest. Existing studies tend to focus on trust as a cognitive process and emphasize source credibility, information quality, information accuracy, information objectivity, and institutional reliability. Although these methods have contributed significantly to the understanding of audience trust, they are primarily based on traditional media concepts and do not consider the overall psychological mechanisms underlying the formation of trust in the digital news context [13-16]. The impact of emotion on audiences' interactions and experiences of digital platforms is becoming more recognised in recent studies, but in most of these cases emotional factors are treated as an environment or contextual factor, not as part of the trust construct itself.

In addition, current measurement methods are highly conceptually fragmented. The majority of the instruments available measure trust in one-dimensional or partial frameworks leading to different operational definitions of trust and to comparability between empirical studies. Theories of digital news trust have increasingly focused on emotional reactions and expectations for the future; this has also been reflected in recent theoretical debates, but is only rarely manifested in empirically validated measurement instruments. However, there is a lack of an accepted multidimensional scale that adequately measures the multi-faceted impact of cognitive evaluation, emotional experience, and forward-looking expectation in a single measurement, and this is a significant gap in current research on digital journalism [17,18].

There is a wealth of research on digital news trust, yet there are still some theoretical and methodological challenges. Current instruments of measurement mainly operationalize trust as a cognitive process and are based on viewers' perceptions of credibility, accuracy and reliability. While recent research on communication has acknowledged the emotional connection between digital news consumption, the concept of emotional trust has not been routinely used as an independent measure dimension. More significantly, the future-oriented trust relates to audiences' expectations of digital news providers' ongoing transparency, consistency and reliability is not well studied in empirical research. Thus, existing measurement efforts only partially reflect digital news trust and do not account for its multidimensionality.

To address these limitations, a measurement framework needs to capture the complexity of today's digital journalism. Trust is emerging as more than just a rational assessment of the quality of information, it is formed through emotional experiences of and expectations for future journalistic performance amidst increased access to algorithmically-produced news, personalized content and multiple digital platforms. A thorough measurement tool ought thus to combine those complementary angles into a single frame that can account for the development of trust within contemporary digital news contexts.

In response to this research gap, the current study constructs and tests a Multidimensional Digital News Trust Scale (MDNTS) with three interrelated dimensions: Cognitive Trust (rational assessments of credibility and information quality), Emotional Trust (psychological trust and affective certainty when consuming news), and Future-Oriented Trust (audiences' trust expectations about the future reliability, transparency and professional responsibility of digital journalism). This study does not merely expand on the current knowledge of cognitive trust measures but also presents an integrated measure framework that encapsulates the general psychological process of the digital news trust.

The study is a quantitative study with scale development method and the proposed instrument is validated by Partial Least Squares Structural Equation Modeling (PLS-SEM). The instrument has been developed systematically based on the

following steps: 1) Identifying the construct, 2) generating items, 3) evaluating with experts, 4) pilot testing, and 5) empirical validation. In this methodological approach, it is ensured that the proposed scale has good reliability and construct validity and that it is a standardized scale that can be used in future quantitative studies in areas related to digital journalism and communication studies.

This study makes a number of contributions. First, it develops the notion of digital news trust by combining the cognitive, emotional and future aspects within one theoretical framework. Second, it designs and empirically evaluates a multidimensional measurement scale to overcome the shortcomings of existing instruments of trust. Third, it offers a standardized instrument for measuring the trust of audiences in today's digital news culture, enabling researchers and media practitioners to have more uniform empirical investigations and offer evidence-informed measures to bolster public confidence in digital journalism.

2. LITERATURE REVIEW

2.1 Digital News Trust: Conceptual Foundations

Digital news trust is a key concept in current communication and journalism studies because of its impact on audiences' acceptance, evaluation, and continued use of digital news. While the initial research on trust focused on the source credibility attributes (accuracy, fairness, objectivity, reliability, and so on) [19] the shift from traditional to digital journalism has significantly broadened its scope. In digital environments, audiences are fewer passive receivers of information, and instead are active users constantly assessing news from various news providers and platforms; this makes that trust is a more dynamic and context-bound concept.

Media and news trust are two related concepts, but they reflect two different levels of audience trust. Media trust refers to general trust in media institutions and communication channels, while news trust refers to trust in the content of the news media, news sources, news producers and news production processes [20]. This distinction has been growing in significance, as digital news is increasingly used via social media sites, search engines, and news aggregators as opposed to directly from news organizations. Thus, the trust placed in a news story is always affected by the credibility of the news story, the news provider and the digital news platform through which it is presented [21].

In the modern era of digital journalism, the notion of trust has been further complicated. Trust has moved away from an assessment of institutional credibility to a multidimensional perception, based on rational evaluations, emotional experiences, and expectations of future journalistic performance, due to the use of personalized news feeds, algorithmic content curation, the presence of user-generated content, and interactive communication [22]. In that sense, current research in communication shows that digital news trust is not only cognitive, but it is also a contextual and multi-dimensional phenomenon that represents the general level of trust in digital news.

From this viewpoint, Digital News Trust is defined for the purposes of this research as an audience's belief that digital news is credible, emotionally reassuring and reliable in both the current and future information landscape. This operational definition consists of three complementary aspects: Cognitive Trust, affective trust (rational judging of credibility and information quality during news consumption); and Future-oriented Trust (audience expectations about the future transparency, consistency, and reliability of digital journalism). The dimensions represent the theoretical basis of the proposed Multidimensional Digital News Trust Scale (MDNTS).

2.2 Existing Digital News Trust Measurement Scales

Digital news trust has undergone significant changes so far as the change of journalism from traditional media to digital communication environment. The first set of measures were mostly drawn from studies related to media trust and source credibility, which focused on audiences' rational judgments of accuracy, objectivity, fairness, expertise, and institutional credibility [23,24]. The measures that were developed were useful in understanding audience trust but were created mainly in traditional media contexts and so did not fully reflect the complexities of the contemporary digital news context.

More recent studies have branched out to include information quality, transparency, platform features and user engagement in the evaluation of digital news trust. However, current measures still focus on thinking about trust as a cognition and emotional reactions are largely regarded as dependent measures. In addition, even though future-oriented trust has attracted more theoretical interest in the audience's future expectations of digital journalism, few future-oriented concepts have been developed into measurable constructs and empirical instruments [25,26].

2.3 Cognitive Dimension of Digital News Trust

The cognitive dimension is the most widely studied aspect of trust in the news and generally forms the theoretical basis for the majority of current news trust measurement instruments. Cognitive trust is about audiences' rational judgment of the reliability of news information, including its believability, accuracy, objectivity, and professionalism. Cognitive trust is more related to analytical judgments that enable people to evaluate journalism information quality and reliability before trusting it compared to emotional trust, which is mostly related to affect [2], [27]. As a result, for a long time it has been considered as the main characteristic of trust in traditional and digital journalism.

Cognitive trust is a product of a number of interrelated factors in a digital news environment. The organization's reputation for expertise, integrity and professionalism is still one of the best indicators of the audience's trust in the source, as is journalists' credibility [28]. Likewise, the quality of information, such as its completeness, relevance, clarity and timeliness of the news content, also plays a key role in audiences' perceptions of the trustworthiness of digital news [19]. Furthermore, accuracy remains one of the key indicators of journalistic work [20] especially in a world filled with misinformation and constantly changing information consumption. The audiences also consider the objectivity of the news, defined as the perceived neutrality, fairness, and lack of bias in news coverage, and reliability, defined as the consistency and dependability of news organizations over time [21].

Previous studies have largely used these cognitive indicators as adequate proxy measures of trust, but they have been consistently found to be strongly associated with audience trust. This implies the audiences are primarily driven to evaluate digital journalism based on their rational assessments. Recent communication research, however, indicates that the formation of trust in interactive digital environments cannot be fully explained through cognitive evaluations alone, because people's emotional responses, social interactions and expectations about future communication behavior can all play a role in shaping trust. [29] However, cognitive trust would not be missing, as it holds a rational component that helps shape other perceptions of trust. In this sense, the cognitive dimension is the first and fundamental dimension that is considered in the proposed multidimensional scale, and not the others.

In this study, therefore, the operationally defined process of cognitive trust is the ability of digital news users to rationally assess news content and its producers as credible, accurate, objective, reliable, and high in informational quality. This construct will be analyzed with items that reflect the dimensions of source credibility, information quality, accuracy, objectivity, and reliability, and will be the first latent variable of the proposed Multidimensional Digital News Trust Scale (MDNTS).

2.4 Emotional Dimension of Digital News Trust

Although cognitive assessments of trust are still essential in trust formation, the digital news landscape is increasingly showing how audiences' emotional experiences while consuming news can also influence trust formation. Emotional trust is a connection between the audience and the digital news provider that is established on a feeling level and that affects whether a person feels psychologically comfortable, emotionally reassured and confident when interacting with journalistic content. Emotional trust is shaped through repeated positive interactions and experiences that lead to feelings of trust, confidence, and reassurance in news sources, as opposed to cognitive trust based on rational judgments about information quality and credibility [10].

There are several interrelated elements to the emotional dimension. Affect is the word used for positive emotions that people feel when consuming news that can affect the way they perceive and interpret the information presented in the news. Emotional reassurance is the degree to which digital news helps to alleviate uncertainty and gives users confidence in understanding the events that are unfolding. Likewise, emotional attachment is the psychological bond that is formed as a result of repeated exposure to trusted news sources and promotes further engagement and sustained use of the news source's content [7]. These emotional responses go beyond the assessment of factual correctness, and are part of a general feeling of confidence in digital journalism.

Trust is another key component of emotional trust, and a sense of psychological safety when consuming digital news plays a crucial role too. Audiences can be unsure and feel anxiety about information in a highly dynamic online context, where misinformation, conflicting stories, and rapidly evolving news are common. These concerns can be addressed through reliable digital journalism by delivering a consistent, transparent and professionally produced news that helps users feel safer, and reduces anxiety. Emotional reassurance helps audiences to engage news content with more confidence and motivates them to continue consuming news from trusted sources [8, 21]. Moreover, those happy experiences foster the emotional self-confidence, that is, audiences' subjective sense of the digital news provider consistently conveying information in a way that promotes emotional comfort and alleviates uncertainty.

Giving this definition, Emotional Trust in this study is defined as the extent to which digital news users feel positive emotions, psychological reassurance, emotional attachment, safe to engage with digital news content and providers, and information-related anxiety reduction and emotional confidence when interacting with digital news content and providers. In the proposed Multidimensional Digital News Trust Scale (MDNTS), this construct is considered the second latent dimension besides cognitive evaluations, capturing the affective processes that come into play in the formation of trust in contemporary digital journalism.

2.5 Future-Oriented Trust

New developments in digital journalism seem to indicate that trust should not be confined to assessment of past or current news experiences, but should also include expectations of future performance of news organizations. Previous studies on trust have tended to conceptualize trust as an appraisal of credibility, accuracy, and reliability that is made in the past. But digital news environments are dynamic and constantly changing, involving new technologies, new modes of work, and

new media environments, and audiences have their expectations that news providers will continue to: provide accurate, transparent and responsible news services into the future [5], [16].

Such a forward-looking outlook has recently been becoming more of a theoretical focus, as the notion of Future-Oriented Trust has investigated how positive expectations about future interactions with digital news platforms can also form part of the idea of trust in digital news. In this position, the future expectations include people's opinions that news media will stick to their professional values, adjust to technology appropriately, and keep delivering trustworthy information in the future. Likewise, anticipatory trust is audiences' confidence in the digital news providers when facing situations of uncertainty or emerging public issues, while future reliability is the audiences' perceptions of the consistency and dependability of journalistic performance over time [16].

The concept is also related to the concept of prospective journalism, in which the trust in journalism is not only regarding the ways journalists report on current events but also in their future capacity to address society's needs, develop new technologies and innovate in meeting audience needs. This viewpoint has been suggested in communication research recently, but there has been little empirical research to date and no instrument for measuring these future-oriented perceptions exists as a separate trust dimension. As a result, one of the least studied aspects of digital news trust is the future-oriented one, even though it has increasing theoretical relevance in the field [18].

In this study, Future-Oriented Trust is therefore operationally characterized as a digital news user's trust in digital news organizations to continue to produce accurate, transparent, reliable and professionally responsible journalism in future information environments. This construct is the third latent dimension of the proposed Multidimensional Digital News Trust Scale (MDNTS), next to cognitive and emotional trust and is related to what audiences expect from digital journalism in terms of its future sustainability and reliability.

3. RESEARCH METHODOLOGY

3.1 Research Design

The proposed Multidimensional Digital News Trust Scale (MDNTS) was developed and validated using a quantitative study design that is cross sectional. The use of a quantitative approach was deemed to be suitable as the main aim of the research was to create a standardized measurement instrument and test its psychometric characteristics using empirical analysis. Scale development research goes beyond exploratory qualitative research, which necessitates the use of statistical techniques to evaluate the reliability of measurement, the construct validity of the instrument, and the overall quality of the instrument.

The study adopted deductive research where the theoretical dimensions derived from literature were transformed to measurable latent constructs. Following this, the three underlying dimensions of digital news trust were identified as Cognitive Trust, Emotional Trust, and Future-Oriented Trust and these were used as a conceptual framework for building the digital news trust measurement instrument.

Data was gathered in a cross-sectional survey at one point in time. The design is commonly used in scale development research, as it allows for the collection of standardized responses from a large enough sample size to allow for the assessment of newly developed measurement instruments and the reliability and validity of the instrument.

The proposed scale was tested for its validity via Partial Least Squares Structural Equation Modeling (PLS-SEM) software was chosen due to its appropriate application in the context of assessing indicator reliability, internal consistency, convergent validity, discriminant validity, and constructing indicator relationships while simultaneously validating the multidimensional measurement model. Furthermore, it is suitable for analysis of latent variable models, which makes it a suitable analytical method for instrument development and validation studies [27, 28]. The general research technique applied was three stages. To find the theoretical frameworks of digital news trust, the literature review was conducted first. Second, the MDNTS was systematically generated, expertly reviewed and pilot tested. Lastly, the instrument was empirically tested by survey data and PLS-SEM to confirm the reliability and the construct validity of the instrument. The entire methodological process is described in Figure 1.

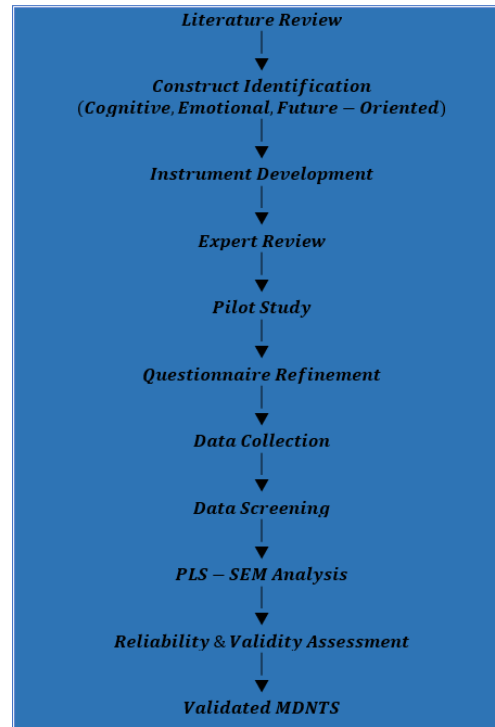


Fig. 1. Overall Research Design of the Proposed MDNTS

3.2 Instrument Development

The Multidimensional Digital News Trust Scale (MDNTS) is a scale that was created systematically and theorized, ensuring that the instrument proposed is able to represent digital news trust in its multidimensionality. Based on the theory developed from the literature, the instrument was developed to assess three complementary latent constructs: Cognitive Trust, Emotional Trust, and Future-Oriented Trust. These constructs collectively depict a rational appraisal, affective reactions, and future expectation of audiences to digital news. The process started with the identification of a first set of measurement items, which was obtained through a comprehensive literature search on news trust, media credibility, digital journalism and audience trust. Current products were scrutinized, modified as necessary and enhanced for the current digital news landscape. To measure and support the conceptualization of Future-Oriented Trust into the multidimensional framework highlighted in the literature, additional items were specifically created for Future-Oriented Trust.

The questionnaire was examined by a group of experts in journalism, media studies, communication research and quantitative methodology to ensure preliminary content validity. All items were evaluated on their relevance, clarity, representativeness and conformance to the intended construct. On the basis of the experts' recommendations, the ambiguous wording was corrected, the redundant statements were removed and some items were adjusted for better readability and conceptual accuracy. A pilot study was then done with a small sample of digital news users to test the clarity and feasibility of the questionnaire. Changes based on feedback received at this stage led to minor linguistic enhancements and changes to the order of the items but did not affect the conceptual content of the proposed constructs. As a result, the theoretical framework of the scale was not altered.

The completed questionnaire consisted of two sections. The first scale items included the demographic data for the respondents, while the second scale items included the measurement items for the three latent constructs of the proposed MDNTS. The questions were rated on a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). This is chosen because it enables an effective balance between measurement sensitivity, convenience of the respondent and statistical reliability. The overall development procedure is summarized as per Table I. Table II shows the finalized structure of the proposed MDNTS, and Table III lists the responses format that was used for all the measurement items.

TABLE I. DEVELOPMENT PROCESS OF THE MULTIDIMENSIONAL DIGITAL NEWS TRUST SCALE (MDNTS)

Stage	Activity	Expected Outcome
Literature Review	Identification of theoretical dimensions of digital news trust	Three conceptual constructs
Item Generation	Development and refinement of measurement items	Initial item pool
Expert Evaluation	Assessment of relevance, clarity, and content validity	Revised questionnaire
Pilot Study	Preliminary testing and questionnaire refinement	Finalized measurement items
Final Instrument	Preparation of the instrument for empirical validation	MDNTS questionnaire

TABLE II. STRUCTURE OF THE PROPOSED MULTIDIMENSIONAL DIGITAL NEWS TRUST SCALE (MDNTS)

Construct	Code	Initial Number of Items	Purpose
Cognitive Trust	CT	6	Measures audiences' rational evaluations of news credibility, accuracy, objectivity, reliability, and information quality.
Emotional Trust	ET	5	Measures emotional reassurance, affective confidence, emotional attachment, and psychological comfort during digital news consumption.
Future-Oriented Trust	FT	5	Measures audiences' expectations regarding the future reliability, transparency, consistency, and professional responsibility of digital journalism.
Total	—	16	Initial multidimensional measurement instrument (MDNTS).

TABLE III. MEASUREMENT SCALE OF THE PROPOSED MDNTS

Response Option	Score
Strongly Disagree	1
Disagree	2
Neutral	3
Agree	4
Strongly Agree	5

3.3 Data Collection and Analysis

The primary audience for this study were digital news consumers who regularly read news online via news sites, mobile apps, and social media. In order to be broadly applicable, no restrictions were placed on respondents' demographic characteristics or digital news platforms of choice. The main data collection tool used was a structured online questionnaire. According to the suggested sample size for PLS-SEM, at least 300–400 respondents are suggested to obtain stability in the result of parameter estimation and good psychometric validation of the model. Completed questionnaires with the required data quality were used for the statistical analysis.

The data collected was subjected to a pre-estimation screening process to determine questionnaires that were incomplete, duplicated, missing answers and non-consistent response patterns. To guarantee reliability of the final dataset, responses that did not meet the predefined quality criteria were omitted. Data analysis was conducted in SmartPLS 4 following the two-stage process of PLS-SEM. The first stage involved the assessment of the measurement model (indicator reliability, internal consistency reliability, convergent validity and discriminant validity). The reliability of indicators was evaluated using outer loading while internal consistency and convergent validity were evaluated using Cronbach's Alpha, Composite Reliability (CR) and AVE. The Fornell–Larcker criterion and HTMT were used for discriminant validity.

Once satisfactory measurement properties were established, the structural model was evaluated to test for the dimensional structure of the instrument. To assess the model parameters' statistical significance, bootstrapping was used, whereas R^2 and Q^2 were used to assess the explanatory power and the predictive relevance, respectively. In combination, they offer detailed evidence of the reliability, validity, and psychometric soundness of the proposed Multidimensional Digital News Trust Scale (MDNTS). The collection data were then tested using the standard assessment procedure in PLS-SEM to assess the psychometric quality of the proposed Multidimensional Digital News Trust Scale (MDNTS). The reliability of the indicators, internal consistency, convergent, discriminant and structural model tests were employed. Table IV shows the summary of the recommended evaluation criteria used in this study.

TABLE IV. PLS-SEM ASSESSMENT CRITERIA USED FOR INSTRUMENT VALIDATION

Assessment Category	Evaluation Metric	Recommended Threshold
Indicator Reliability	Outer Loading	≥ 0.70
Internal Consistency	Cronbach's Alpha	≥ 0.70
Internal Consistency	Composite Reliability (CR)	0.70–0.95
Convergent Validity	Average Variance Extracted (AVE)	≥ 0.50
Discriminant Validity	HTMT	< 0.85
Structural Model	Bootstrapping (p -value)	< 0.05
Explanatory Power	R^2	≥ 0.25
Predictive Relevance	Q^2	> 0

4. RESULTS

The empirical results of the proposed Multidimensional Digital News Trust Scale (MDNTS) are described in this section. The results are presented in 4 stages. First, the characteristics of the data gathered and the respondent characteristics are discussed. Second, the measurement model is measured using indicator reliability, internal consistency and convergent validity techniques. Third, discriminant validity is evaluated by the Fornell – Larcker criterion and by the Heterotrait – Monotrait ratio (HTMT). Lastly, the proposed multidimensional scale is tested for its structural validity through the bootstrapping, explanatory power (R^2) and predictive relevance (Q^2).

4.1 Respondent Characteristics

Digital news users were reached via several online communication channels with a structured online questionnaire. 420 questionnaires were sent out, with 401 replies (95.5% response rate). 17 responses were rejected at data screening due to inconsistent responses, duplicate responses, or incomplete questionnaire. Thus, 384 usable responses were included in the final statistical analysis (valid response rate 91.4%). Table V summarizes the response process to the survey.

TABLE V. SURVEY RESPONSE SUMMARY

Item	Value
Questionnaires Distributed	420
Questionnaires Returned	401
Invalid Responses	17
Valid Responses	384
Response Rate	95.5%
Valid Response Rate	91.4%

Table VI shows the demographic characteristics of the respondents. There was a balance between male and female with 203 females (52.9%) and 181 males (47.1%). The majority of respondents were aged 18-25 years (30.7%) and 26-35 years (36.2%), indicating that the older age group was the most active digital news consumer group. In terms of education, 53.4% reported having a Bachelor's degree, 29.2% having a Master's degree and 17.4% a doctoral qualification. Additionally, 69.3% of the respondents said they use digital news every day, indicating that the sample was skewed towards digital news regulars. The above demographic data suggest that the sample of the collected data was suitable for the validation of the proposed MDNTS.

TABLE VI. DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS (N = 384)

Characteristic	Category	Frequency	Percentage
Gender	Male	181	47.1%
	Female	203	52.9%
Age	18-25 years	118	30.7%
	26-35 years	139	36.2%
	36-45 years	84	21.9%
	Above 45 years	43	11.2%
Education	Bachelor's Degree	205	53.4%
	Master's Degree	112	29.2%
	Doctoral Degree	67	17.4%
Digital News Usage	Daily	266	69.3%
	Several Times per Week	84	21.9%
	Weekly	34	8.8%

4.2 Measurement Model Assessment

The indicator loading of all the measurement items were examined to assess the measurement model before assessing the reliability and validity of the proposed Multidimensional Digital News Trust Scale (MDNTS). The first one consisted of 16 indicators which were spread across the three latent constructs, namely Cognitive Trust, Emotional Trust and Future-Oriented Trust. Based on the recommended criteria for PLS-SEM, the indicators with outer loadings less than 0.70 were carefully examined, and the indicators that did not meet the criteria were removed to enhance the reliability of the constructs and convergent validity, while maintaining the theoretical consistency.

The first assessment found one indicator (CT6) had an outer loading of 0.684, just too low compared to the acceptable outer loading of 0.70. This value was very near to the acceptable value; however, the removal of this indicator led to significant increases in the internal consistency reliability and convergent validity. Furthermore, the remaining indicators were enough to represent the concept of Cognitive Trust, so CT6 was discarded from the final measurement model. Therefore, the refined MDNTS kept 15 indicators, each of which was comprised of five indicators representing each latent construct. After CT6 was removed, the model was re-estimated to assess the reliability of the indicators, the internal consistency of the scales and the convergent validity by exploring Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). The outcomes of the tests are summarized in Table VII

TABLE VII. MEASUREMENT MODEL ASSESSMENT OF THE PROPOSED MDNTS

Construct	Item	Outer Loading	Cronbach's α	Composite Reliability (CR)	AVE	Decision
Cognitive Trust	CT1	0.764	0.853	0.895	0.631	Retained
	CT2	0.812				Retained
	CT3	0.781				Retained
	CT4	0.851				Retained
	CT5	0.798				Retained
	CT6	0.684				Removed
Emotional Trust	ET1	0.782	0.887	0.918	0.692	Retained
	ET2	0.846				Retained
	ET3	0.821				Retained

	ET4	0.874				Retained
	ET5	0.816				Retained
Future-Oriented Trust	FT1	0.806	0.912	0.934	0.739	Retained
	FT2	0.873				Retained
	FT3	0.851				Retained
	FT4	0.892				Retained
	FT5	0.839				Retained

In Table VII, all retained indicators had good outer loadings of more than the recommended 0.70, showing that all indicators are reliable. Only one indicator (CT6) loaded, with a value of 0.684 slightly below the recommended value. Although it was slightly below the threshold, its removal helped the psychometric performance of the Cognitive Trust construct and did not affect its theoretical representation. This meant that the indicator was removed from the final scale that was proposed.

After model refinement, the internal consistency reliability of the three constructs were satisfactory. The reliability for both Cronbach's Alpha and Composite Reliability (CR) values were greater than the required value of 0.70, and did not suggest any excessive redundancy in the measurement items. Moreover, the Average Variance Extracted (AVE) for all three constructs ranged from 0.631 to 0.739, indicating the satisfactory convergent validity. Overall, the results suggest that the refined 15-item MDNTS has acceptable psychometric characteristics and it is suitable for further examination of its discriminant validity and structural model.

4.3 Discriminant Validity

To test discriminant validity, the three latent constructs of the proposed Multidimensional Digital News Trust Scale (MDNTS) were tested for whether they are conceptually distinct. To assess discriminant validity, two types of complementary approach were followed, in accordance with the recommendations for PLS-SEM: the Fornell–Larcker criterion and HTMT. Using both approaches yield a full picture of construct distinctiveness and helps to minimize measurement overlap.

The Fornell–Larcker criterion involves the comparison of the square root of the Average Variance Extracted (AVE) of each construct with each of its other correlations. As shown in Table VIII, the square root of the AVE is higher than the inter-construct correlations for all constructs, demonstrating the acceptable discriminant validity for all constructs. The results indicate that indicators of each construct have more variance with indicators of its own construct than with indicators of other constructs, which is consistent with hypothesized conceptual distinctiveness of the three proposed dimensions.

TABLE VIII. FORNELL–LARCKER CRITERION

Construct	Cognitive Trust	Emotional Trust	Future-Oriented Trust
Cognitive Trust	0.794		
Emotional Trust	0.561	0.832	
Future-Oriented Trust	0.487	0.618	0.860

The HTMT was then computed to further support the discriminant validity. All HTMTs were under the recommended threshold of 0.85, as seen in Table IX, which would further confirm that the three constructs are empirically different. The highest HTMT value (0.712) was still far below the critical value, therefore, there was no significant overlap between the latent constructs.

TABLE IX. HTMT MATRIX

Construct	Cognitive Trust	Emotional Trust	Future-Oriented Trust
Cognitive Trust	—		
Emotional Trust	0.712	—	
Future-Oriented Trust	0.641	0.694	—

In general, the Fornell–Larcker criterion and the HTMT analysis demonstrated good discriminant validity of the proposed MDNTS. The findings show that there are three empirically distinct but theoretically related dimensions of digital news trust: Cognitive, Emotional, and Future-Oriented Trust. Thus, the measurement model is suitable for further structural validation because it meets the recommended discriminant validity requirements.

4.4 Structural Model Assessment

After the acceptable measurement reliability and discriminant validities were established, the structural model was tested to examine the overall robustness and predictive power of the proposed Multidimensional Digital News Trust Scale (MDNTS). Three widely accepted criteria for PLS-SEM evaluation were used: statistical significance of the structural paths resulting from bootstrapping, explanatory power (R^2), and predictive validity (Q^2). These indicators offer further evidence of validity and applicability of the proposed multidimensional measurement model.

To determine the statistical significance of the relationships between the three latent dimensions and the higher-order construct of Digital News Trust, a bootstrapping procedure was carried out with 5,000 resamples. Table X shows that all three dimensions were found to be statistically significant contributors to the overall construct ($p < 0.001$), indicating that

each dimension of digital news trust, namely, Cognitive Trust, Emotional Trust, and Future-Oriented Trust, is meaningful in representing digital news trust.

TABLE X. STRUCTURAL MODEL ASSESSMENT

Path	Path Coefficient (β)	t-value	p-value	Statistical Significance
Cognitive Trust $\rightarrow$ Digital News Trust	0.331	8.47	<0.001	Significant
Emotional Trust $\rightarrow$ Digital News Trust	0.386	9.82	<0.001	Significant
Future-Oriented Trust $\rightarrow$ Digital News Trust	0.429	11.08	<0.001	Significant

The proposed model was then evaluated for its explain ability with the coefficient of determination (R^2). As per the existing PLS-SEM guidelines, the obtained R^2 value of 0.647 demonstrates a good to moderate level of variance explained by the three latent dimensions in the context of explaining variance in Digital News Trust.

The model's predictive relevance was then assessed by the Stone–Geisser predictive relevance statistic (Q^2). The calculated Q^2 value was 0.431, which was far above the zero value, indicating that the measurement model proposed has good predictive power. The results indicate that the MDNTS is not only a trustworthy instrument with valid measurement characteristics, but also has meaningful prediction performance in use for digital news trust research. The coefficient of determination (R^2) and the Stone–Geisser predictive relevance statistic (Q^2) were then used to further assess the model's explanatory power and predictive relevance of the proposed Multidimensional Digital News Trust Scale (MDNTS). These indices give complimentary information on how well the model accounts for the variance of the latent construct and how well it predicts observed data. The values obtained are tabulated in Table XI.

TABLE XI. PREDICTIVE PERFORMANCE OF THE PROPOSED MDNTS

Evaluation Metric	Value	Interpretation
Coefficient of Determination (R^2)	0.647	Moderate-to-Substantial Explanatory Power
Predictive Relevance (Q^2)	0.431	Strong Predictive Relevance

In a general way, the assessment of the structural model backs the stability of the proposed Multidimensional Digital News Trust Scale (MDNTS) with more empirical evidence. All three dimensions made significant contribution to the higher-order construct and the obtained R^2 and Q^2 values showed good explaining and predicting power. All of these results suggest that the 15-item MDNTS is a psychometrically robust instrument for measuring digital news trust in the current digital journalism context and can serve as a solid basis for future empirical studies.

5. DISCUSSION

This study aimed to develop and validate a multidimensional instrument for measuring Digital News Trust combining three types of trust the Cognitive Trust, Emotional Trust, and Future-Oriented Trust—in one measure. The empirical results show that MDNTS has acceptable psychometric properties, as reflected by high indicator reliability, internal consistency, and convergent and discriminant validity, along with the performance of the structural model. Such results contribute to the notion of digital news trust as a multi-dimensional process, beyond a mere cognitive evaluation, in line with recent theoretical approaches that suggest that digital news trust is not only a cognitive process [9].

It also shows that the Cognitive Trust is still a crucial factor in digital news trust. The indicators were still found to have good reliability and validity, suggesting that audiences continue to assess digital news by its traditional journalistic qualities of accuracy, objectivity, credibility, and quality of information. This finding aligns with the earlier findings that indicated that news trust and media credibility depends on cognitive evaluation [2]. It must be noted that the elimination of one cognitive indicator during the validation process also demonstrates that not every theoretically relevant indicator is necessarily equally important to the measurement quality and that the empirical process of scale development is key.

The findings, in addition to the cognitive assessment, show that Emotional Trust is an independent and statistically valid aspect of digital news trust. The overall performance of this construct indicates that there is a high psychometric score and this implies that the emotional reassurance, confidence and psychological comfort of the audience has a significant influence on establishing the level of trust in digital journalism. The results of the study are consistent with the previous studies in the field of communication studies that have concentrated on the conceptual level and rarely been used in developing some validated measurement instruments to measure emotional issues [10], [15]. The proposed scale aims to capture audience's trust in the digital news context more comprehensively as an emotional trust which is not a second-hand phenomenon of credibility.

The main contribution of this study is the validation of future-oriented trust dimension. Existing research has focused on current perceptions of credibility and institutional trust, but more recently, theoretical research has indicated that audiences are increasingly assessing news providers in terms of their expected future transparency, consistency and professional responsibility [16]. This construct has been empirically validated, as it is the first evidence that there is a reliable measure of future oriented expectations that can be incorporated into a multi-dimensional trust construct. The strong reliability and validity obtained from this dimension give initial empirical evidence to extend digital news trust beyond initial cognitive and emotional assessment.

On a theoretical level, the study adds to the communication and journalism literature by offering an integrated conceptualization of digital news trust by integrating the rational evaluation, emotional experience and future expectations

into a single measurement framework. The proposed MDNTS is more comprehensive than earlier instruments which concentrated on the cognitive credibility or the institutional trust of digital journalism. The study therefore not only provides a validated measurement tool but also extends the theoretical knowledge of the process of developing trust in hybrid digital media environments.

The scale was also validated and provides significant practical applications for researchers and media professionals. The MDNTS offers researchers a standardized tool that they can use in future quantitative research into audience trust in digital news in various contexts and platforms. The multi-dimensional framework can be used as a diagnostic tool for journalists, editors and media organizations to identify which elements in the frame affect audience trust. News organizations can go beyond mere fact checking to build audience trust by making the information more transparent, emotionally reliable, and delivering high-quality news over time.

However, there are some limitations. First, the study used a cross sectional survey design which captures perceptions of the respondents at one time, and therefore does not take into account changes in trust over time. Second, while the proposed scale proved to have good psychometric properties, further validation in other cultural, linguistic, and media contexts would enhance the scale's generalizability. Third, the study did not differentiate between types of digital news platforms or news providers, which could affect the audiences trust in digital news differently.

There is therefore a need for future studies to be longitudinal to explore the validity of the scale over time and across changing digital news environments. The instrument would be further validated internationally by cross-cultural validation in terms of different languages and media systems. Additionally, future research can further expand upon the proposed framework by examining the relationship between digital news trust and other constructs like news avoidance, selective exposure, media literacy, user engagement and behavioral intentions. These inquiries would help to develop a larger understanding of audiences' trust and can support future developments of the Multidimensional Digital News Trust Scale (MDNTS).

6. CONCLUSION

This study designed and tested an instrument to measure multidimensional aspects of audience trust in a modern digital news context, the Multidimensional Digital News Trust Scale (MDNTS). The scale offered, which is different from traditional measurement systems used to focus mainly on the cognitive assessment of credibility, combines three distinct types of trust Cognitive Trust, Emotional Trust, and Future-Oriented Trust into a multidimensional scale. This is a reflection of the changing nature of digital journalism, in which the public may judge the trustworthiness of the information being provided, but also its emotional experience and their expectations of what it will be like to get in the future from digital news providers. The empirical validation verified that the instrument has a satisfactory psychometric property. The reliability of the indicators, the internal consistency, the convergent validity, the discriminant validity of the measurement model, and the explanatory and predictive power of the proposed multidimensional framework were good in the measurement and structural assessment of the model. After the refinement process, the final 15-item MDNTS was found to be a valid and reliable tool to measure trust in digital news in the three proposed dimensions. This research's main value is the extension of the concept of digital news trust beyond the traditional cognitive approach. The study's empirical validation of the two dimensions, Emotional Trust and Future-Oriented Trust, as independent but complementary constructs contribute to existing communication and journalism research, and also provides a more comprehensive perspective on the evaluation of digital news media in more complex media contexts. The validated scale also offers researchers a standardizable measure tool that will help future empirical studies and allow for comparisons to be made among studies. In practice, the proposed instrument provides useful information for journalists, news media, and media practitioners to help build audience trust. The multidimensional framework emphasizes that building public trust goes beyond accurate and credible reporting to creating emotional trust and retaining long-term expectations of transparency, consistency and professionalism. Although the contributions were made, there are some limitations in the study. The findings are based on cross sectional survey data and cannot reflect the changes in audience trust over time. Besides, further validation in various cultural contexts, media systems, and digital platforms will enhance the generalizability of the suggested instrument. Further studies are needed, however, in longitudinal and cross-cultural designs of study, examining the consistency of the MDNTS and also examining the relationship between the MDNTS and related constructs like media literacy, news engagement, selective exposure, news avoidance, etc. The MDNTS is overall theoretically informed and empirically validated measure of digital news trust. It provides a strong instrument for communication research and a platform for future research on audience trust in the dynamic and fast-changing digital news landscape.

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