

# **Framing the Internet: Before and After the Tech Bust**

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**Abstract:** This study analyzes the framing of the Internet in newspapers before and after March 2000 to test if market conditions change the way coverage of an issue is framed, thus coloring the public's view, particularly those of non-users. Three years of newspaper coverage were analyzed to determine relevant frames around the Internet and any patterns that were affected by the declining market.

**Introduction.** The Internet has become a popular and ubiquitous medium in our culture. The most recent study by the U.S. Department of Commerce reports that as of September 2001, 174 million people or 65.6 percent of the U.S. population were computer users. One hundred forty three million people or 53.9 percent of the population used the Internet (“A Nation Online,” U.S. Department of Commerce).

Many researchers have studied the communication potential of the Internet as a medium. Not only is it an important medium in which to study, it is being reported on as a phenomenon in various other media, such as newspapers, television, and magazines. This coverage can affect the general nature of public sentiment about technology. Prior to March 2000, much hype had been created regarding online services and features, both positive and negative. The Internet was also garnering market attention, with dotcoms acquiring venture capital and causing the NASDAQ exchange to soar to record-breaking highs. But the high expectations came to an abrupt halt after uncertainty about the online business models and their inability to achieve profitable results. In March 2000, the NASDAQ exchange, that had reached an all time high in excess of 5000 points, experienced an abrupt and then gradual decline, from which the exchange and the resulting U.S. economy have not yet recovered. A five-year low was reached of 1108 points in the fourth quarter of 2002, with the current level at 1715 points as of August 1, 2003.

With the market slowdown, the growth in number of Web sites has also slowed. While the total number of Web sites has risen to 8,745,000, the growth rate from 2000-2001 was 18%, down from 52% in the prior year. (“The Dot-com Meltdown,” Pew Internet & American Life Project).

A Markle Foundation Report in June 2001 found that most people are still optimistic about the potential of the Internet. While the enthusiasm has waned about business potential of the technology, 50% of those surveyed feel that the economic effects of technology were broad-based and that the “growth in high-tech companies, such as computer and dot-com companies

benefits everyone.” (Markle Foundation, June 2001). The study further points out that those who do not go online hold an exception to this view. The study suggested, “Internet non-users may be picking up caricature images of the Internet from the media.”

Attitudes about technology can influence the rate of diffusion or the process by which the innovation is adopted. Diffusion theory identifies factors that interact in this process. The communication of the technology, along with the technology itself, time, and the social system in which it operates influence the diffusion of technology. (Rogers, 1995) Diffusion theory interacts with the process of learning in meaning creation. In addition to knowledge about a domain, learning also results in feelings about the domain and associated behaviors. (Perse, p. 131) The knowledge gap theory can help to explain why some segments of society create different meanings or do not have access to certain types of information. (Tichenor, Donohoe, & Olien, 1970) A knowledge gap is created when low socio-economic status or educational attainment in audience members limits access to information, or in this case, information technology.

The purpose of this study is to analyze the framing of the Internet in newspapers before and after March 2000, to test if market conditions change the way coverage of an issue is framed, thus coloring the public’s view, particularly those of non-users. Media coverage is one way in which the public learns about an issue, thus influencing technology diffusion, and affecting the way in which knowledge gaps are created or dealt with in our society.

**Literature Review.** The area of literature that most applies to this study is that of the analysis of the contents of texts. Usage of content analysis in communications research has a long history. In 1952, Berelson offered this definition: "(C)ontent analysis is a research technique for the objective, systematic, and quantitative description of the manifest content of communication." (Berelson, 1952) The focus on manifest content indicates that the definition is most concerned with actual meaning rather than implied or connoted. Holsti, in 1969, defined content analysis as "any technique for making inferences by objectively and systematically identifying specified characteristics of the messages." (Holsti 1969) The emphasis here is on the systematic nature of the process. Krippendorff (1980) further highlights this characteristic with "(c)ontent analysis is a research technique for making replicative and valid inferences from data to their context." This view places the emphasis further on the text as "data" and the importance of validity and reliability in the research. Finally, in 1998, Riffe, Lacy, and Fico elaborated on the process of content analysis by describing it as "the systematic assignment of communication content to categories according to rules, and the analysis of the relationships involving those categories using statistical methods." (Riffe, Lacy, Fico, 1998)

Content analysis has been applied in a variety of areas of communication research. Framing is one such area. Framing as defined by Entman is selecting "some aspects of a perceived reality" to enhance their salience "in such a way as to "promote a particular problem definition, causal interpretation, moral evaluation and/or treatment recommendation." (Entman, 1993) Frames can be used as a strategy by humans to help with processing vast amounts of information, a process of selection and prioritization, or as Goffman relates, frames help audiences "locate, perceive, identify, and label" the flow of information around them. (Goffman, 1974) In regard to media, Reese offered the following definition for frames: "Frames are organizing principles that are socially shared and persistent over time, that work symbolically to meaningfully structure the social world." (Reese, pp. 11) But when used by media workers in setting the context of a story, framing can serve to promote certain values and discourage

others. Framing differs from bias, however, in that it is more sophisticated and complex, reflections the richness of media discourse and subtleties of nuances of debates, and can have a subtle, yet powerful, influence on audiences. (Tankard, pp. 96-97) Another approach recommends a focus on the rise and fall in importance of frames over time rather than centering on the power of particular messages. (Gandy, p. 373).

Beyond framing, the concept of agenda setting looks to identify the relationship between public opinion and media frames. Agenda setting is a hypothesis that the degree of emphasis placed on an issue in the news influences the public's prioritization of such issues. (McCombs & Bell, 1996) In the first level of agenda setting, the objects under study can be issues, political candidates, institutions, or ideas that are being presented in a certain light or priority. Beyond looking at objects, the second level of agenda setting deals with "the transmission of attribute salience," or the characteristics of the objects. (McCombs, Esteban-Lopez, Llamas, 2000) But this is not to suggest a direct approach to media effects. One must also consider the production process and the audience engagement and experience in the texts in creating meaning (Pan & Kosicki, p. 39).

Content analysis researchers often rely on theories of linguistics to verify their results. According to Wittgenstein, "the meaning of a word lies in how it is used in the language, in how it is applied." (Brand, 1979) The selection of terms, frequency of their usage, and the proximity of surrounding context have inherent meaning in texts. (Lind & Salo, 2002) Political pollsters and survey researchers have long known that the way in which one words a question can have a significant impact on the resulting answer. (Tankard, p. 95) Choice of words and contexts influence the meanings created and thus the diffusion of the idea.

Content analysis and agenda setting techniques have often been applied to media surrounding political campaigns and candidate images. Such studies include the relationship between frames present in the *Chicago Tribune* and Illinois voters' descriptions of the candidates in the 1976 Presidential election, (Weaver, Graber, McCombs, & Eyal, 1981),

correlation between attributes found in Newsweek and attributions given to candidates by New York Democrats. (Becker & McCombs, 1978), and the agenda setting effects of attributes in the 1996 general election in Spain. (McCombs et al, 2000) Other content analyses have focused on the media's portrayal of issues, including anarchists' protests (Hertog & McLeod, 2001), political correctness (Dickerson, 2001), motorcycle outlaws (Fuglsang, 2001), debates on wetland policy (Miller and Reichart, 2001), feminism (Lind & Salo, 2002), and the breast implant controversy (Andsager & Powers, 1999; Darling-Wolf, 1997). These studies show the breadth of content analysis research and the ability to apply these techniques across diverse issues.

Miller, Andsager and Reichart looked at the images of GOP Presidential candidates in the 1996 election (Miller, Andsager, and Reichart, 1998) and employed computerized content analysis techniques. The authors employed the software program, VB Pro, developed by Miller, to compare candidate images in press releases and news coverage. The program was used not only to analyze frequencies of terms, but also to create clusters of relevant terms in the manifest content to be used as categories.

The use of computers for content analysis has grown more commonplace over the past 20 years. This includes the usage of computers to identify and access content, to create content categories, as well as to analyze the frequency and occurrence of terms in context.

As early as 1969, Holsti provided suggestions as to when computerized content analysis was considered useful:

1. When the unit of analysis is the symbol or word, and analysis concerns number of times a word is used.
2. When analysis is extremely complex, such as using a large amount of text, a large number of categories, or the analysis relies on finding co-occurrence of terms in context.
3. When the analysis involves analyzing the data in multiple ways.
4. When the data is of basic importance to a variety of discipline and might be used in multiple studies.

Holsti further warned of situations in which the usage of computers might not be appropriate:

1. When the research involves a single, expensive, specialized study.
2. When the number of documents is large but the information is limited.
3. When the research calls for measures of space or time.

4. When thematic analysis is being used. (Holsti, 1969)

While Holsti's general warnings are still important to consider before using computerized techniques for any analysis, the propagation of computer equipment and software has greatly reduced the price associated with performing such studies (as noted in #1 and #2 above).

The question exists as to whether computerized content analysis can yield comparable results over traditional coding methods. In 1991, Nacos et al. compared the same content analyzed by humans and computers on two data sets, the Grenada invasion and the Three Mile Island incident. They found correlations in one data set but not the other, thus offering warnings as to the usage of computerized content analysis for issues of topic complexity and the ability to categorize beyond programmed rules. This is similar to Holsti's warning above regarding using computers for thematic analysis.

The following study draws on the above literature by applying an understanding of the study of content analysis as it relates to framing and agenda setting, but also the relevance of the meaning of language via linguistics. In order for computer-assisted methods to produce significant results, the assumption must be made that frequency, selection, and placement of words have meaning, and that meaning can be gathered via computerized techniques. This study has many of the attributes that Holsti mentioned for successful application of computerized techniques, specifically that the analysis involves usage and frequency of words, consists of large amounts of data easily accessible in electronic format, and that the data may be analyzed in multiple ways. It does offer challenges in identifying optimism or pessimism in texts over time.

**Research Questions.** Coverage of the Internet as the topic of news articles is the focus of this study. In analyzing relevant articles, the following questions will be addressed to further understand the ways in which the media represent the Internet or World Wide Web.

RQ1: What are the major frames that are found in news coverage of the Internet or Web?

RQ2: Is there a significant difference amongst frames across the years in study?

RQ3: Based on the identified frames, what are the patterns of frequency before and after March 2000, the time of the initial NASDAQ decline?

RQ4: How has the tone of coverage changed after the tech bust of March 2000?

**Method.** In this study, media coverage of the Internet or Web is the dependent variable and the three time periods represent the independent variables, a different approach to agenda setting (McCombs & Reynolds, p. 12) that traditionally uses media coverage to predict audience effects. Articles from the *Austin American-Statesman* were chosen for each of the following periods:

- March 1999-February 2000 – Pre-bust
- March 2000-February 2001 – Post-bust
- March 2001-February 2002 – Updated

*The Statesman* was chosen for this sample based on the tech-centric nature of Austin.

There are many technology firms in the Austin area. The tech bust of March 2000 directly impacted several area companies. Large numbers of layoffs and closings had a dramatic effect on the nature of the community. *The Statesman* articles reflect intense coverage of Internet and technology issues. The Nexus database was used to select and archive articles. Articles from the front page of any section of the newspaper were chosen if they included the words “Internet”, “Net”, or “Web” in the headline. This strategy was used to identify the most prominent articles on the subject that would be the most likely to catch the attention of the general public, not just those with a specific interest in technology. Articles that contained the search terms but

did not pertain to the Internet were excluded (i.e. generic usage of the term “net” not in the context of the Internet).

The articles were organized into one file for each time period, excluding any header, graphic, or additional information beyond the text. Two content analysis computer programs were used to analyze the text, VBPro and Diction 5.0. VBPro, a text analysis tool developed by Dr. Mark Miller, was used to analyze the resulting files for relevant frames. (Miller, 2001) Several VBPro features assisted in identifying frames. A frequency analysis was done of the merged Pre-, Post-, and Updated files to identify terms that were used 80 times or more. VB Select was used to compare the files to identify terms that were disproportionately used in each. A preliminary codebook was created from the associated files. The VBMap feature was used with the preliminary codebook to identify co-occurrence of terms in a clustering matrix (Miller & Reichart, p. 116). The data yielded terms that could be grouped across four major frames:

- **Technology** – general information about computers, technology, hardware, and software (ex. network, DSL, cable, hardware, software)
- **Investment/Finance** – terms regarding investment in dotcom companies and the effects on the market (ex. securities, NASDAQ, stocks, profits)
- **Policy/Legal** – terms associated with government action such as taxation, legislation, and regulation. (ex. regulators, Congress, legal, legislation) This frame also includes discussion of digital divide or unequal access of technology.
- **Entertainment/Usage** – terms associated with how the technology is used, such as email, job hunting, music downloading, surfing, school, work, online shopping, health, and personal usage. This will also include any article dealing with the downside of technology usage like social isolation and Internet addiction.

Each of the above frames was organized into a master codebook of terms. The frequency of each frame was analyzed and compared with each year under study. This method used a combination of the clustering analysis in VBPro (Miller & Reichart, 2001) and a list of frames approach (Tankard, p. 100).

An attempt to use VBPro to break the articles into distinct categories based on frames was unsuccessful. In most cases, evidence of each of the four frames was found to some degree in particular articles. A delineation of the articles into the four frames was necessary to

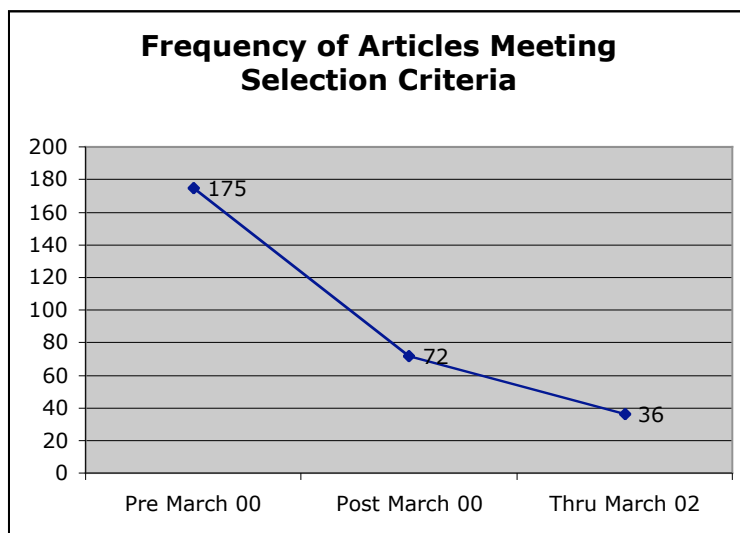
look at differences in tone within the frames. To do so, each article was read and assigned to a relevant frame. For example, an article about a technology product conference was categorized under technology, and an article about a particular usage of the technology, like email or Web surfing was categorized as Entertainment/Usage. This exercise also provided a manner in which to test the reliability of the frames defined by the VMap clustering processes. While a few articles had evidence of more than one frame, each was placed in a single frame depending on the main emphasis of the article.

A second program, Diction 5.0 (Hart, 2001) was used to apply its standardized dictionaries and methodologies to assess for five standard qualities:

- **Certainty**-Language indicating resoluteness, inflexibility, and completeness and a tendency to speak ex-cathedra.
- **Activity**-Language featuring movement, change, the implementation of ideas and the avoidance of inertia.
- **Optimism**-Language endorsing some person, group, concept or event or highlighting their positive entailments
- **Commonality**-Language highlighting the agreed-upon values of a group and rejecting idiosyncratic modes of engagement.
- **Realism**-Language describing tangible, immediate, recognizable matters that affect people's everyday lives

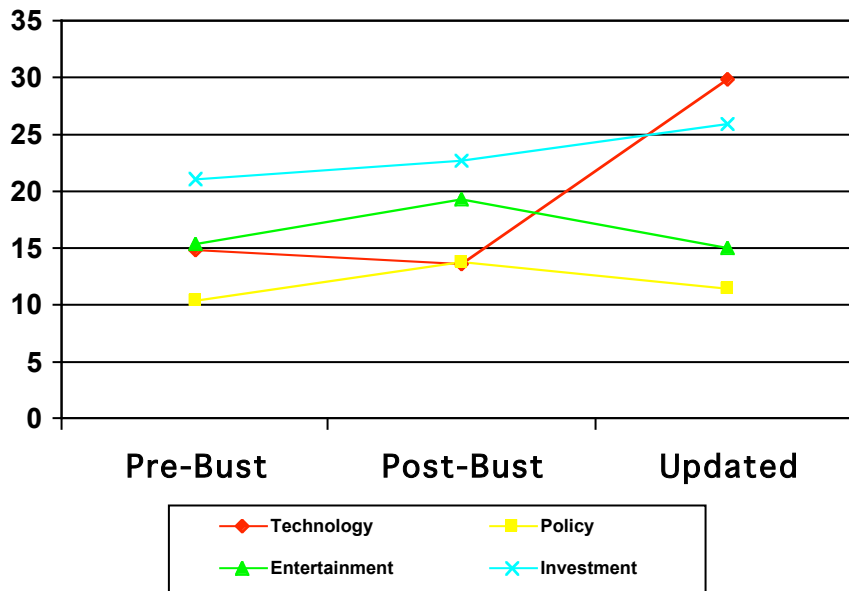
The Diction program was run for each of the three time period files, as well as for time period files that were created for the four frames (totaling 12 files).

**Results.** Analysis of frequency of articles shows that for the one-year period before March 2000, 175 articles met the selection criteria. For the year after March 2000, that number decreased to 72 articles, thus indicating a change in the frequency of coverage or the reduction of hype around the Internet. In the follow-up year of coverage (March 2001-Feb. 2002) only 36 articles met the criteria. In addition to the reduction of hype, this may also be explained by the reduction of the news hole due to lower advertising revenues in light of the declining economy.



Frequencies of the four major frame terms were analyzed for each year under study. The years 1999/2000 and 2000/2001 were compared via correlation to determine if there was a difference in the overall representation of frames across periods. The 1999/2000 period was highly correlated, meaning that little change occurred in the overall representation of frames for this period. For the 2000/2001 period, a lower correlation was identified reflecting a dramatic increase in the Technology-oriented frame.

Figure 1

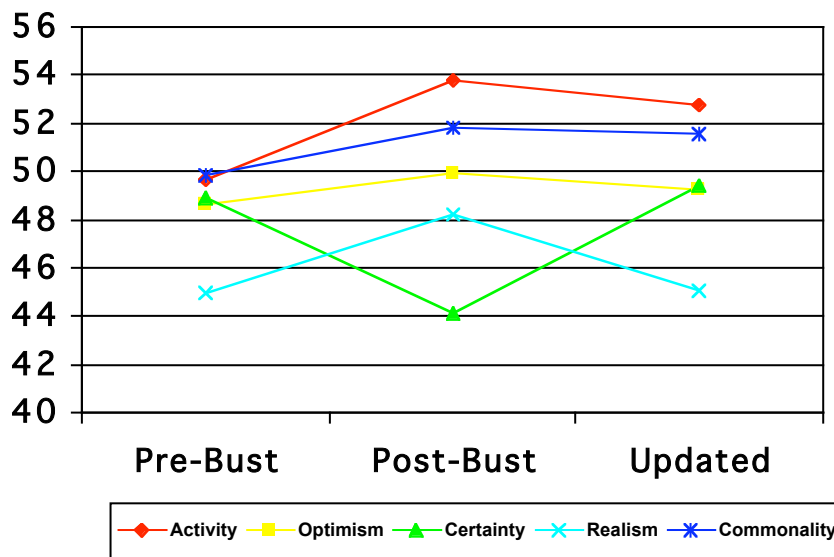


Weighted frequency of frame							
	Pre-Bust	Post-Bust	Updated	99/00 change	p value	00/01 change	p value
<b>Technology</b>	14.74	13.57	29.89	(1.17)	0.64	16.32	0.01
<b>Policy</b>	10.35	13.83	11.43	3.48	0.12	(2.40)	0.44
<b>Entertainment</b>	15.31	19.24	14.94	3.93	0.11	(4.29)	0.18
<b>Investment</b>	21.10	22.76	25.86	1.67	0.45	3.09	0.43

Differences by year were compared via T-test to indicate significance. The most significant changes occurred in the Technology frame from 2000-2001, and the Policy/Legal and Entertainment/Usage frames for 1999-2000.

To assess tone, scores of optimism, certainty, realism, and other relevant measures via Diction 5.0 were compared for study years as well. The results appear in Figure 2. Diction produces standardized scores with results easily comparable. The most notable changes were in the Activity and Certainty variables from 1999-2000 and the Certainty and Realism variables in 2000-2001. The smallest changes overall were found in the Optimism and Commonality categories.

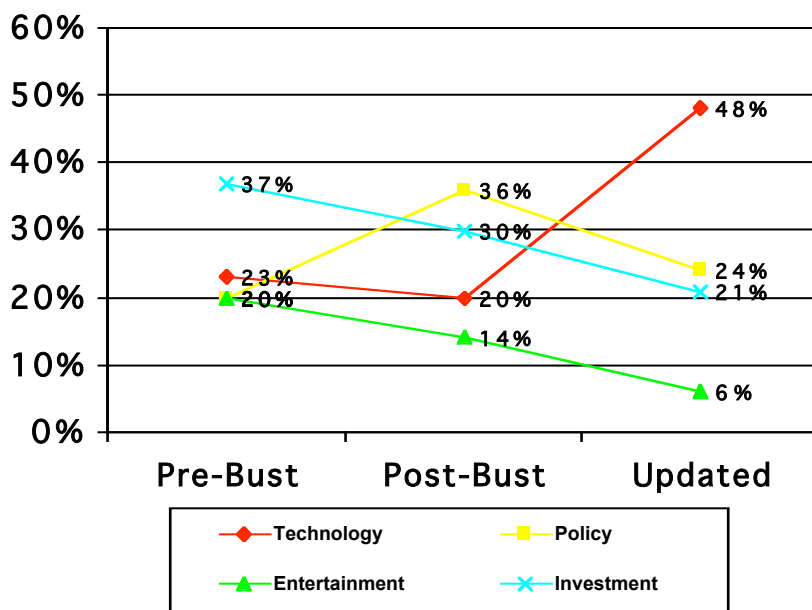
Figure 2



Summary - Master Variables for Total Files by Year						
	Pre-Bust	Post-Bust	Updated	99/00 change	00/01 change	
<b>Activity</b>	49.71	53.79	52.76	4.08	-1.03	
<b>Optimism</b>	48.66	49.89	49.20	1.23	-0.69	
<b>Certainty</b>	48.90	44.14	49.40	-4.76	5.26	
<b>Realism</b>	44.92	48.22	45.02	3.30	-3.20	
<b>Commonality</b>	49.87	51.78	51.57	1.91	-0.21	

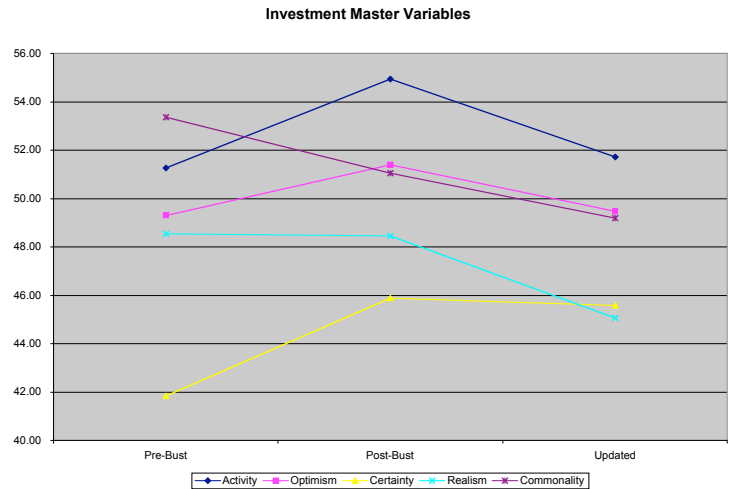
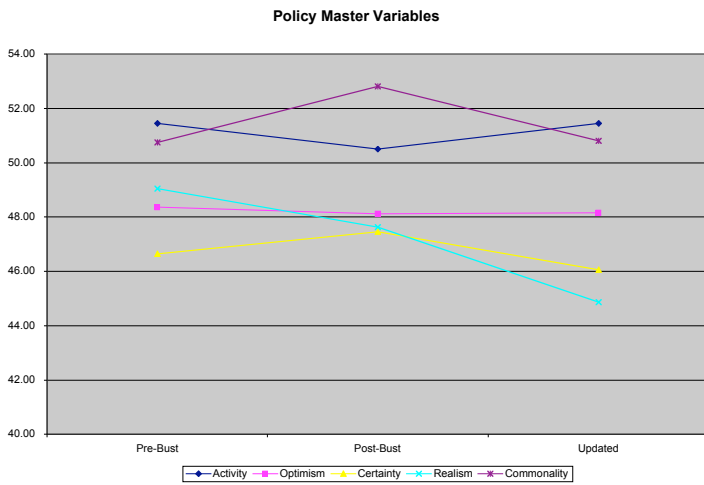
As mentioned above, each article was assigned one of the four frames based on its central theme. The percentage of articles in each frame is presented in Figure 3. These results show a decline in the Entertainment and Investment frames, with an increase in the Policy frame over time.

Figure 3



Next the Diction methods were applied to each of the 12 files that were created for each by time period, and the results are presented in Figure 4. The highlighted variables indicate those that are considered out of normal range. All below range scores were found in Certainty and Realism, while only two above range scores were found in Commonality. The largest variances were found in the Realism variable for Technology over 1999-2000, the Activity variable for Technology for 2000-2001, Certainty and Activity variables for Investment in 1999-2000, and the Activity and Realism variables in Investment for 2000-2001. The Optimism variable declined over time in the Technology frame, but either remained constant or increased in the Post-Bust period and then subsequently decreased to original levels in the Updated period for all other frames.

# Framing the Internet: Before and After the Tech Bust



Master Variable by Frame												
	Technology			Policy			Entertainment			Investment		
	Pre-Bust	Post-Bust	Updated	Pre-Bust	Post-Bust	Updated	Pre-Bust	Post-Bust	Updated	Pre-Bust	Post-Bust	Updated
<b>Activity</b>	49.26	48.01	52.79	51.46	50.50	51.46	51.44	50.78	53.73	51.26	54.94	51.72
<b>Optimism</b>	51.19	50.90	48.44	48.36	48.12	48.15	47.31	48.65	47.48	49.31	51.40	49.47
<b>Certainty</b>	44.60	46.57	43.84	46.64	47.45	46.06	47.05	44.75	45.25	41.84	45.88	45.58
<b>Realism</b>	49.38	43.57	45.30	49.04	47.62	44.86	45.76	48.47	47.97	48.54	48.47	45.06
<b>Commonality</b>	48.84	48.84	50.18	50.75	52.81	50.80	49.84	49.19	49.86	53.37	51.06	49.20
<b>Variance</b>		<b>99-00</b>	<b>00-01</b>		<b>99-00</b>	<b>00-01</b>		<b>99-00</b>	<b>00-01</b>		<b>99-00</b>	<b>00-01</b>
<b>Activity</b>		(1.25)	4.78		(0.96)	0.96		(0.66)	2.95		3.68	(3.22)
<b>Optimism</b>		(0.29)	(2.46)		(0.24)	0.03		1.34	(1.17)		2.09	(1.93)
<b>Certainty</b>		1.97	(2.73)		0.81	(1.39)		(2.30)	0.50		4.04	(0.30)
<b>Realism</b>		(5.81)	1.73		(1.42)	(2.76)		2.71	(0.50)		(0.07)	(3.41)
<b>Commonality</b>		-	1.34		2.06	(2.01)		(0.65)	0.67		(2.31)	(1.86)
<b>Range</b>	<b>Low</b>	<b>High</b>										
<b>Activity</b>	46.74	55.48										
<b>Optimism</b>	46.37	52.25										
<b>Certainty</b>	46.90	51.96										
<b>Realism</b>	46.10	52.62										
<b>Commonality</b>	46.86	52.28										

**Discussion.** The above analysis indicates some interesting trends in news coverage based around the Tech Bust of March 2000. First the number of articles that addressed the Internet, Net or Web in their headlines was sharply decreased across time periods, being cut by more than half in each year. This indicates an end to the hype around the Internet and a return to a more reasonable level of coverage for such issues. It also shows a more conservative position in terms of number of articles as the journalists and the public becomes more familiar with technology topics. When looking at the trends of individual frames, the Technology and Investment frames remained fairly constant in the years before and after the bust. But the Policy and Entertainment frames showed increases in the same time period, indicating more emphasis on how the technology is used and what is being done to control its usage and propagation. In the Updated time period, the role of the frames return to the Pre-bust era in that Technology and Investment articles predominate. Technology frames jumped in frequency by 16.3% in that period, significantly above 1999 levels. This indicates that a period of skepticism was created after the bust that has been assuaged with the passage of time and what has resulted is a focus again on the nature of technology and not the ways in which it can be controlled. It is possible that the media are detecting a need for the public to have a stronger understanding of technology before being able to participate in policy debates over its usage.

In assessing for tone, the Diction analysis yielded that the Optimism variable had a minor increase after the bust. Optimism by frame decreased for Technology, but increased in other areas. A change in Optimism around the Investment frame was anticipated, but that frame showed increases in Optimism, Activity, and Certainty in the Post-bust period. Looking at Optimism in the Updated period (2000-2001), one does see a decrease in Optimism, indicating a lag in the media's coverage from a position of hopefulness that the market bust was perhaps temporary, but ultimately a resignation as to the new state of the market.

Also in regard to Investment, the Commonality and Realism variables decreased over time, indicating terminology that does not reflect the values of society or that are relevant to

everyday people. Discourse after the tech bust could be discouraging discussion of broader participation in the success of technology that was more evident in the Pre-Bust era.

In regard to Policy, all variables showed a reduction or maintenance over time, except for the Commonality variable that first increased, then decreased down to its original level. It is important to remember that the terrorist activity of September 11 occurred in the final period under study. It is possible that some of the Policy discussion revolved around changing the way society has traditionally handled problems of security and privacy.

The Entertainment frame showed a sharp increase in Optimism in the Pre-Bust period, but an equally sharp decline after the Bust. The Realism variable showed the same Pre-Bust increase, but a less sharp decline. These increases could be the result of the propagation of the technology to the point that new uses were being thought about positively and were being made relevant to the public. The Post-Bust period showed that these feelings may have returned to their Pre-Bust levels.

**Conclusion.** The results of this analysis show changes in frames and tone regarding the Internet over the period under study due mainly to the reaction to the tech bust of March 2000. While overall coverage declined, interaction between frames indicated a decrease in the Technology frame in the Pre-Bust period offset by an increase in the other three frames. But in the Updated period, coverage of the Technology frame prevailed, with the Policy and Entertainment frames returning to their Pre-Bust levels. When coding individual articles by frame, the Post-Bust Period exhibited an increase in Policy frames, indicating attention to control and legislation in light of the market disappointment. Looking specifically at the Policy frame, a decline in Realism was witnessed over time, indicating the abstract nature of policy coverage around technology. The Investment frame exhibited declines in Commonality and Realism, thus highlighting the way coverage shifted to the more complex nature of the investment environment.

Thus, the Markle Foundation's assumption that changes in attitudes of Internet non-users were mainly driven by images found in the media was found to be supported to some extent in this study. While the Optimism variable did not show significant changes over time or within frames, other frames of Realism, Certainty, and Commonality showed distinct shifts that could contribute to a decline in optimism about the technology. Future studies should analyze the same frames in other newspapers; perhaps in cities that are less tech-centric, or with broadcast news or popular media, to see if a change in frames and decline in optimism can be detected. Audience-based research could also be incorporated to differentiate attitudes between users and non-users, and to assess from where these attitudes are being derived.

New media itself can be viewed as a conceptual frame (Gandy, 2001). By describing something as new, certain attitudes accompany that characterization. The Internet is often framed as a new medium, bringing with it both optimism and uncertainty surrounding its usage and potential. Over time, as the Internet becomes more ubiquitous, it will be interesting to see how the new media frame changes and what it will incorporate and discard.

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**Additional resources:**

- VBPRO documentation, Mark Miller, <http://excellent.com.utk.edu/~mmmiller/vbpro.html>
- Diction Documentation, Roderick Hart, <http://www.scolari.com/diction/>