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THE NEWSPAPER OF THE FUTURE: A STRAW-MAN PROPOSAL IN FOUR PARTS

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INTRODUCTION

The newspaper industry has been referred to as the smoke-stack industry of the communications age. On the contrary, it is unsurpassed in its ability to gather and organize vast quantities of time-sensitive information. The weakness of the industry lies in its outmoded distribution and presentation of that information, as well as its inability to be responsive to the needs of both individual readers and advertisers. Mass media no longer need be monolithic, impersonal, synchronous, colloquial or prepackaged. Rather, newspapers can be redefined to be distributed, responsive to personal needs and interests, timely, international and dynamically presented.

In this straw-man proposal, we argue that in order to have maximum impact, the newspaper industry must provide timely delivery while facilitating local formatting, personalization and advertising acuity. This refashioning of the industry will be made possible by the intersection of mass media, personal computing and modern communications systems. Ultimately, it is the form in which the information is encoded and made available which will open or close doors to future applications and markets. The underlying premise of this proposal is that the future of not only newspapers, but also all forms of information dissemination, lies in cooperation between the information provider and the audience, both of whom will be operating in a computationally-rich environment.

1. THE INFORMATION COMMODITY

The technology of using electrons rather than child labor to disseminate information will be ubiquitous and inexpensive no matter what action (or inaction) is taken by the newspaper industry. The plethora of new and emerging digital communications channels is bringing us to the threshold of an era where bandwidth will be exploited as a commodity, rather than as an expensive, scarce resource, controlled by only a few people. There will be competition among multiple, hybrid networks of copper, fiber, cellular grid, satellite and terrestrial broadcast. These infrastructures will be capable of community, national and global communication. Wireless communication channels will be used in abundance, allowing information to stay topical as we move about undeterred.

The battle for the information franchise between information providers and data carriers will rapidly become a non-issue, even before Judge Green steps down. Strategic alliances will be formed: the regional telephone operating companies, while not positioned nor predisposed to be in the news-gathering business, are very ready to be in the news-carrying business. The role of a carrier is to keep a "composition" together across the network, and, most important, to keep track of billing.

Regardless of the communications channel involved, people will still need to gather and organize the news. Although remote sensing will account for some automated newsgathering, reporters will still report. Managing editors will still establish the framework in which news gatherers operate. There will be a broader pool of sources, as well as a broader reach for both staff and free-lance work. For example, international syndication will be easily maintained.

Sources of news will include wire services, magazines (digital, unpacked form), national/international press, local reports, newsletters and personal electronic mail. This range of sources will call for a credibility industry, a report to consumers, to help readers wade through the potential multitude of information sources. An audit trail will be a customary part of the data passed to consumers.

The monthly "information bill" will be based on sessions or transactions rather than on packets, e.g. the voice model rather than the data model. A basic service charge will be used with a premium for special content and real-time access. Secondhand news and yesterday's news will be discounted! Access to archives will be billed accordingly.

2. SIGNALS WITH A SENSE OF THEMSELVES

Data recycling, reaching new markets with the information which has been captured and organized for a single, dwindling market today, is the challenge and opportunity

of the new technology. Ink-on-paper distribution precludes the design of a signal in which the content, and not just the packaging or encoding, is accessible to local manipulation. The decoupling of distribution of information from its packaging is the most expedient way to participate in new markets: In response to instructions from both the distributor and the reader, a "structured" signal can be tailored to suit a context. Closed-captioning is an example of inadvertent structure which can be exploited to create new styles of presentation, such as compositing TV news with the wire services. Information "objects" will include the usual assortment of tags such as dateline, byline and source. Other, more salient features include speaker identification, cadence and intonation for audio, foreground and background segmentation and models for image, context and editorial bias for text. Market demand for new information services will be gated by the amount of "leakage" of copyrights and property rights (e.g., a frame from a video used to illustrate a wire service story).

New data structures are predicated by advanced text, image and audio display and manipulation technologies available at a reasonable cost. These technologies include small and portable devices, such as wristwatch and speech I/0 (e.g., coming off the desktop), and thin, flat, big displays with paper-like (laser printer) resolution. Both 21/2 and 3-dimensional, windowless displays will emerge which routinely employ dynamics and transparency. Input will include speech, gaze, and touch. And, truly in the future, beyond touch screens: A slight smile, grimace or twinkle in your eye should do the trick. The combination of structure and display technology advances enable the newspaper to augment and be augmented by other media such as television, radio and electronic mail. News will be distributed with enough structure so that design and layout can be done in the home. Look and feel will be both bought off the shelf and customized.

While a newspaper demands the attention of the reader, the passivity of TV lets the viewer watch with her ears, while doing something else. Future presentation media will straddle these extremes. Information will get to us wherever we are, by whatever means available. The data stream will be continuous, while access will vary by time, place and style. Concurrence and synchronization will be maintained as presentation modalities switch between serial, in the style of television or radio, parallel, in the style of the traditional newspaper, or interactive, as in a direct manipulation computer interface.

Fax papers are a current diversion. They may be successful in niche markets; even though they provide an alternative means of distribution on a small scale, they do not provide information in a form which is amenable to manipulation. Facsimile precludes electronic manipulation. Electronic media will provide the opportunity for forms of data distribution that invite participation.

3. A READERSHIP OF ONE

Personalization, or customer-directed content, will be a result of advances in content analysis and user modeling. The gigabits pouring into your home will be a full super-set of information which is locally filtered by your machines to create "your news." The alternative is to filter centrally and deliver to you a distillation at a low bit rate. The actuality will be a mix of the two approaches.

Customer-directed content analysis will encompass the selection, summarizing and headlining of stories in a personal way. User modeling includes a redefinition of "newsworthy" to include personal information that is important only to one person or a very few people (e.g., the system telling your alarm clock that your 7:00A.M. flight to Chicago is delayed by an hour). Text will be annotated with keywords, relational summaries and hot links. Part of this annotation will be automated by AI systems and other parts will be added by human editors or writers. Packagers (both natural and artificial) will construct summarizing documents which refer to (and pay royalties for) other documents. Eventually, summaries generated by the home computer will take advantage of an individual's particular background; until then, summaries generated by human beings (the packagers) will suffice.

Annotated text and packages will be sent to home computers for processing and compositing. The personal newspaper will combine generated packages based on the source, interests, connection with previously read or flagged articles, and citations. The reader will be presented with a set of summaries, organized by priority. Personality sliders, such as a political bias control, will enable the reader to directly manipulate the editorial biases which shepherd the content of the presentation. This personality profile will become a commodity; the perspective of Palestinian living in Kuwait or a corn farmer in Iowa will be available at a modest price.

Just as the future newspaper will "know" the content, it will also be cognizant of the individual reader. The more the system knows about each reader, the better able it will be to make sense of a volatile definition of newsworthiness, which both accounts for changing interests and inherent ambiguities and inconsistencies. Access to personal data, such as your computerized appointment book, will enable your newspaper to make a determination of whether "there are 45 great minutes of reading here" or "don't bother tonight."

Personalization involves the full exploitation of the reader's computational environment. Both information normally provided by the computer (idle time, schedule information, electronic mail subscriptions) and more esoteric information (physical location tracking, eye tracking, conversation eavesdropping, reading, viewing and shopping history) will be integrated to construct dynamic, individual models. These models will be responsive both to changes in the reader's needs and to the newspaper's understanding of its readers.

4. ADVERTISING AS NEWS AND ENTERTAINMENT

The advertisers will go where the audience is, regardless of the medium of distribution or presentation. To the extent that news information reaches an audience, advertising revenues will help finance it. The advent of more directed advertising, controlled jointly by the information distributors and the consumers, heralds a restructuring of the financial structure of journalism in which information and entertainment remain valuable commodities.

One possibility for the future is that as advertisers no longer foot the bill, consumers will pay for information access directly. An alternative future is one in which advertising becomes integrated into the information itself as part of the content, perhaps in the form of news, entertainment or as an electronic yellow pages. Your car will tell your TV that it is time to start showing you tire ads. In this context, there is an alliance between the advertiser and the consumer. Both personalized ads and "ads as we need them" will continue to subsidize a large portion of the information industry.

The newspaper's monopoly in gathering ads will be difficult to maintain when access is not through ink on paper, but rather electronic. There are several markets which are well suited for electronic distribution: classified, real estate, help wanted, etc. Currently there are numerous attempts to build national and international services for these markets which could rapidly erode an important revenue source for traditional newspapers, forcing their hand earlier than expected. The online database services have already made inroads into niche markets.

5. SUMMARY

Mass media and personal computing are on a collision course. The newspaper of the future will emerge from their interfusion.