Attention Economics: Mastering Your Focus in a Digital World

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Attention economics is an approach to the management of information that treats human attention as a scarce commodity, and applies economic theory to solve various information management problems. Put simply by Matthew Crawford, "Attention is a resource--a person has only so much of it."

In this perspective Thomas H. Davenport and J. C. Beck define the concept of attention as:

Attention is focused mental engagement on a particular item of information. Items come into our awareness, we attend to a particular item, and then we decide whether to act. (Davenport & Beck 2001, p. 20)

As content has grown increasingly abundant and immediately available, attention becomes the limiting factor in the consumption of information.

A strong trigger of this effect is that the mental capability of humans is limited and the receptiveness of information is hence limited as well. Attention is used to filter out the most important information by the human brain from a large pool of information surrounding the human in the digital age. A number of software applications either explicitly or implicitly take attention economy into consideration in their user interface design, based on the realization that if it takes the user too long to locate something, they will find it through another application. This is done, for instance, by creating filters to make sure the first content a viewer sees is relevant, of interest, or with the approval of demographics. An attention-based advertising scheme may say they are measuring the number of "eyeballs" by which their content is seen.

History

Herbert A. Simon was perhaps the first person to articulate the concept of attention economics when he wrote:

"...in an information-rich world, the wealth of information means a dearth of something else: a scarcity of whatever it is that information consumes. What information consumes is rather obvious: it consumes the attention of its recipients. Hence a wealth of information creates a poverty of attention and a need to allocate that attention efficiently among the overabundance of information sources that might consume it" (Simon 1971, pp. 40-41).

He noted that many designers of information systems incorrectly represented their design problem as information scarcity rather than attention scarcity, and as a result they built systems that excelled at providing more and more information to people, when what was really needed were systems that excelled at filtering out unimportant or irrelevant information (Simon 1996, pp. 143-144).

In recent years, Simon's characterization of the problem of information overload as an economic one has become more popular. Business strategists such as Thomas H. Davenport or Michael H. Goldhaber have adopted the term "attention economy" (Davenport & Beck 2001).

Some writers have even speculated that "attention transactions" will replace financial transactions as the focus of our economic system (Goldhaber 1997, Franck 1999). Information systems researchers have also adopted the idea, and are beginning to investigate mechanism designs which build on the idea of creating property rights in attention (see Applications).

Intangibles

According to digital culture expert Kevin Kelly, the modern attention economy is increasingly one where the consumer product costs nothing to reproduce and the problem facing the supplier of the product lies in adding valuable intangibles that cannot be reproduced at any cost. He identifies these intangibles as:

Immediacy - priority access, immediate delivery
Personalization - tailored just for you
Interpretation - support and guidance
Authenticity - how can you be sure it is the real thing?
Accessibility - wherever, whenever
Embodiment - books, live music
Patronage - "paying simply because it feels good",
Findability - When there are millions of books, millions of songs, millions of films, millions of applications, millions of everything requesting our attention -- and most of it free -- being found is valuable."

Social Attention, Collective Attention

Attention economy is also relevant to the social sphere. More specifically, long term attention can also be considered according to the attention that a person dedicates managing its interactions with others. Dedicating too much attention to these interactions can lead to "social interaction overload", i.e. when people are overwhelmed in managing their relationships with others, for instance in the context of social network services in which people are the subject of a high level of social solicitations. Digital media and the internet facilitate participation in this economy, by creating new channels for distributing attention. Ordinary people are now empowered to reach a wide audience by publishing their own content and commenting on the content of others.

Social attention can also be associated to collective attention, i.e. how "attention to novel items propagates and eventually fades among large populations." (Wu & Huberman 2007)

Applications

In Advertising

"Attention economics" treats a potential consumer's attention as a resource. Traditional media advertisers followed a model that suggested consumers went through a linear process they called AIDA - Attention, Interest, Desire and Action. Attention is therefore a major and the first stage in the process of converting non-consumers. Since the cost to transmit advertising to consumers is now sufficiently low that more ads can be transmitted to a consumer (e.g. via online advertising) than the consumer can process, the consumer's attention becomes the scarce resource to be allocated. Dolgin also states that a superfluidity of information may hinder the decision making of an individual who keeps searching and comparing products as long as it promises to provide more than it is using up.

Controlling Information Pollution

One application treats various forms of information (spam, advertising) as a form of pollution or 'detrimental externality'. In economics an externality is a by-product of a production process that imposes burdens (or supplies benefits), to parties other than the intended consumer of a commodity. For example; air and water pollution are 'negative' externalities which impose burdens on society and the environment.

A market-based approach to controlling externalities was outlined in Ronald Coase's The Problem of Social Cost (Coase 1960). This evolved from an article on the Federal Communications Commission (Coase 1959), in which Coase claimed that radio frequency interference is a negative externality that could be controlled by the creation of property rights.

Coase's approach to the management of externalities requires the careful specification of property rights and a set of rules for the initial allocation of the rights. Once this has been achieved, a market mechanism can theoretically manage the externality problem. The solution is not necessarily simple in its application to media content (Hay 1996).

E-mail Spam

Sending huge numbers of e-mail messages costs spammers very little, since the costs of e-mail messages are spread out over the internet service providers that distribute them (and the recipients who must spend attention dealing with them). Thus sending out as much spam as possible is a rational strategy: even if only 0.001% of recipients (1 in 100,000) is converted into a sale, a spam campaign can be profitable (Mangalindan 2002). Spammers are demanding valuable attention from potential customers, but they are avoiding paying a fair price for this attention due to

the current architecture of e-mail systems.

One way this might be implemented is by charging senders a small fee per e-mail sent, often referred to as a "Sender Bond." It might be close to free for an advertiser to send a single e-mail message to a single recipient, but sending that same e-mail to 1000 recipients would cost him 1000 times as much. A 2002 experiment with this kind of usage-based e-mail pricing found that it caused senders to spend more effort targeting their messages to recipients who would find them relevant, thus shifting the cost of deciding whether a given e-mail message is relevant from the recipient to the sender (Kraut 2002).

Closely related is the idea of selling "interrupt rights," or small fees for the right to demand one's attention (Fahlman 2002). The cost of these rights could vary according to the interruptee: interrupt rights for the CEO of a Fortune 500 company would presumably be extraordinarily expensive, while those of a high school student might be lower. Costs could also vary for an individual depending on context, perhaps rising during the busy holiday season and falling during the dog days of summer. Interruptees could decline to collect their fees from friends, family, and other welcome interrupters.

Another idea in this vein is the creation of "attention bonds," small warranties that some information will not be a waste of the recipient's time, placed into escrow at the time of sending (Loder, Van Alstyne & Wash 2004). Like the granters of interrupt rights, receivers could cash in their bonds to signal to the sender that a given communication was a waste of their time or elect not to cash them in to signal that more communication would be welcome.

Supporters of attention markets for controlling spam claim that their solutions are superior to the alternatives for managing uses of information systems on which there is no consensus on the question of whether it is pollution or not. For example, the use of e-mail or text messages for rallying political support or by non-profit charitable organizations may be considered spam by some users but legitimate use by others. Laws against spam put the power to make this decision in the hands of government, while technological solutions like filtering technologies put it in the hands of private companies or technologically savvy users. A market-based solution, on the other hand, allows the possibility of individual negotiation over the worth of a given message rather than a unilateral decision by a controlling party (Loder, Van Alstyne & Wash 2004, p. 10). Such negotiation itself consumes attention and carries with it an attention cost, though.

Web Spam

As search engines have become the primary means for finding and accessing information on the web, high rankings in the results for certain queries have become valuable commodities, due to the ability of search engines to focus searchers' attention. Like other information systems, web search

is vulnerable to pollution: "Because the Web environment contains profit seeking ventures, attention getting strategies evolve in response to search engine algorithms" (Page 1998). It is estimated that successful exploitation of such strategies, known as web spam, is a potential $4.5 billion per year business (Singhal 2004, p. 16).

Since most major search engines now rely on some form of PageRank (recursive counting of hyperlinks to a site) to determine search result rankings, a gray market in the creation and trading of hyperlinks has emerged. Participants in this market engage in a variety of practices known as link spamming, link farming, and reciprocal linking.

However, as opponents of the "nofollow" attribute point out, while this solution may make it incrementally easier for search engines to detect link spam, it does not appreciably change the incentive structure for link spammers unless 100% of existing systems are upgraded to support the standard: as long as some critical mass of spammable sites exists, link spam will continue. Furthermore, the "nofollow" attribute does nothing to combat link farming or reciprocal linking. There is also a philosophical question of whether the links of site commentators (as opposed to site owners) should be treated as "second-class," leading to the claim that the attribute "heists commentators' earned attention" (NoNoFollow.net 2005).

Another issue, similar to the issue discussed above of whether or not to consider political e-mail campaigns as spam, is what to do about politically motivated link campaigns or Google bombs (Tatum 2005). Currently the major search engines do not treat these as web spam, but this is a decision made unilaterally by private companies. There is no opportunity for negotiation over the question of what is an appropriate use of attention expressed through hyperlinking. It remains to be seen whether a market-based approach might provide more flexible handling of these gray areas.

Sales Lead Generation

The paid inclusion model, as well as more pervasive advertising networks like Yahoo! Publisher Network and Google's AdSense, work by treating consumer attention as the property of the search engine (in the case of paid inclusion) or the publisher (in the case of advertising networks). This is somewhat different from the anti-spam uses of property rights in attention, which treat an individual's attention as his or her own property.