Comments and Suggestions Welcomed
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Some Economics of Personal Activity and Implications for the Digital Economy

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Abstract

This paper documents, from 1925 to the present, some important historical facts about personal activity and commercial efforts to attract personal attention. First, increases in personal time spent with media as the primary focus of activity match closely increases in total personal discretionary time. Second, the share of advertising spending in total economic output (GDP) has been roughly constant long-term. Third, real advertising spending per person-hour spent with media has been roughly constant long-term. These historical facts suggest that the traditional approach of buying personal attention through media advertising will not support relatively rapid growth in the digital economy, even with significant changes in media technology such as higher bandwidth and greater interactivity. The growth of the digital economy is likely to depend instead on growth of discretionary time and integration of digital technology into new forms of socializing, transacting, and spending time.

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A knowledgeable communications industry participant stated:[3]

> *One succinct definition of a digital economy is the economy that occurs when an industry's products change, as Nicholas Negroponte would put it, from atoms to bits. …Atom-based products, like books and newspapers, are not going away, but their production is being pushed out to the fringes, so that it can be done at the least possible minute and only in the exact quantities required. …There are many reasons why it's preferable to work with bits instead of atoms. I'd like to use a hokey Star Trek analogy to suggest the magnitude of this change. On Star Trek, when you want to eat, you walk over to the food replicator, tell it what you would like, and it produces the food for you instantly. In other words, Star Trek envisions a world where food is digital. …It would all be done with networks and mass storage.*

Does the above passage provide a good definition of the digital economy? Does the Star Trek analogy capture key aspects of forthcoming economic changes?

Here's some more food for thought. In the US in 1998, consumers spent 52% more on food purchased for home consumption than on purchased meals.[4] Economies of scale in food preparation, the cost of food inventory and equipment maintenance, and the specialized knowledge and skill that improve food quality all provide incentives for persons to outsource meals, i.e. eat in restaurants, cafeterias, etc. There has in fact been a significant trend in this direction.[5] Nonetheless, why is purchasing and preparing food still so economically significant when apparently more efficient alternative arrangements are readily available?

This paper proceeds from the belief that, to understand the digital economy, one should focus not on atoms or bits, but on persons' activities and how persons interact with each other. Persons like cooking as an activity that occupies time. Persons like, even as bad cooks, to be able to influence the character of the food they eat. They also like to share their cooking, and talk and complain about it. Thus I predict that many persons will continue to cook irrespective of other technological and economic developments relating to meal production.[6] More generally, personal activity, creativity, and sociability are goods in any sort of economy. Persons seek ways to occupy their time, they seek ways to make their own personal mark on their surroundings, and they seek interaction with and recognition from other persons. The most important aspects of new digital information processing and communications technologies are likely to relate to how they affect general patterns of personal activity, creativity, and sociability,

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[3] Rosenblatt, Bill, "How is networked digital technology changing the economy," Sunworld, May 1997, available online at http://sunsite.nstu.nsk.su/sunworldonline/swol-05-1997/swol-05-bookshelf.html

[4] Calculated from Statistical Abstract of the United States: 2000, Table No. 723.

[5] In the US in 1990 consumers spent 76% more on food purchased for home consumption than on purchased meals. Calculated from ibid.

[6] More specifically, I doubt that the current rapid growth of spending on purchased meals relative to spending on food for home consumption will continue for the next several decades.

Put differently, analysis of the development of the digital economy must be broader than considerations of the organization of production, the value of goods extrinsic to persons, and the performance of particular tasks. The question "Where do you want to go today?" provides little insight into the amount of time spent watching television, the demand for residential voice telephone minutes, or the rapid growth of instant messaging.[7] More relevant analysis concerns the nature, amount, and use of persons' discretionary time and the extent to which different environments and stimuli attract attention and generate activity. While of course there is an irreducible element of mystery to persons,[8] there is also much relevant evidence that provides important insights into the likely evolution of the digital economy.

This paper documents, from 1925 to the present, some important historical facts about personal activity and commercial efforts to attract personal attention. First, increases in personal time spent with media as the primary focus of activity match closely increases in total personal discretionary time. Second, the share of advertising spending in total economic output (GDP) has been roughly constant long-term. Third, real advertising spending per person-hour spent with media has been roughly constant long-term. These historical facts suggest that the traditional approach of buying personal attention through media advertising cannot support relatively rapid growth in the digital economy, even with significant changes in media technology such as higher bandwidth and greater interactivity. The growth of the digital economy is likely to depend instead on growth of discretionary time and integration of digital technology into new forms of socializing, transacting, and spending time.

I. Habitual Ways of Spending Time

Television has been a great new-media success story. Even without explicit government universal service programs, in most countries a large share of households have a television, and the share of households with television is usually larger than the share with telephones.[9] Many households have more than one television; in the US in 1998 on average there was almost one television per person five years of age or older.[10] Persons across a wide range of countries typically spend about 15 hours per adult per week

[7] "Where do you want to go today?" has been used as a Microsoft marketing slogan. A Linux group in Germany used the slogan "Where do you want to go tomorrow?" and attracted a complaint from Microsoft. See http://slashdot.org/articles/99/04/12/194253.shtml . Both phrases reflect similar assumptions about how persons use technology.

[8] One might consider this to be an implication of the Heisenberg Uncertainty Principle.

[9] See International Telecommunication Union (ITU), *World Telecommunications Indicators* (1999), Table 18. Among low income countries, both the share of households with a telephone and the share with television are available for six countries in 1998. The country and figures are Bosnia, telephone 15%, television 6%; Haiti, telephone 16%, television 32%; Mongolia, telephone 11%, television 28%; Pakistan, telephone 2%, television 48%; Sudan, telephone 4%, television 67%; Zambia, telephone 2%, television 64%. In the US in 1998, the share of households with a telephone was 94% and the share with television was 97%.

[10] Ibid, Table 18 shows 84.7 televisions per 100 persons in the US in 1998. The share of persons five years or older in the US in 1998 was 93% (Statistical Abstract of the US: 2000, Table No. 12).

watching television as their primary activity.[11] Time watching television as a primary activity typically accounts for about a third of total personal discretionary time.[12]

What is the key to television's success in widely different economic, cultural, and programming environments? The contrast between the US and the USSR in the mid-1980s highlights the attraction of television. In the mid-1980s television programming and broadcasting in the USSR was state-owned, state-controlled, and highly centralized.[13] Households had little opportunity to choose between programs: 68% of households received two or fewer program channels.[14] In contrast, television in the US in the mid-1980s was privately owned and commercially driven, and television offered viewers many programming choices; 88% of households received five or more over-the-air television signals, while cable systems, with median capacity of over 30 channels, passed 76% of households.[15]

Despite these and other sharp contrasts between the US and the USSR, the television set, the way television was watched, and time spent watching television were remarkably similar. In both the US and the USSR the average viewer sat on a couch and watched a rectangular colored screen about two meters away.[16] In the US in 1985 television viewing times for employed men and women were 14.6 and 12.1 hours per week respectively.[17] In Pskov, USSR in 1986, television viewing times for employed men and women were 14.5 and 10.7 hours per week respectively.[18] One might debate whether television programming in the USSR was better or worse than that in the US. Clearly it was much different. There were also many fewer choices available for viewers, who lived in much differently ordered societies. Rather than speculating about differences in the quality of programming or the quality of the audience, a simple explanation for these facts is that television programming content has not strongly shaped the physical characteristics of viewing or the amount of viewing time.[19]

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[11] This figure is based on time budget studies. Television ratings services report significantly larger figures. For a discussion of the issues, presentation of data, and references to sources, see Galbi, Douglas, "Communications Policy, Media Development, and Convergence," available on http://www.ssrn.com and http://www.galbithink.org .

[12] Ibid.

[13] Campbell, Robert W., *Soviet and Post-Soviet Telecommunications* (Boulder, Co: Westview Press, 1995), Chapter 7.

[14] Id. p. 147.

[15] Setzer, Florence, and Jonathan Levy, *Broadcast Television in a Multichannel Marketplace*, FCC Office of Plans and Policy Working Paper Series #26 (June 1991) Table 1, p. 18; Table 15, p. 68.

[16] Housing arrangements were much different in the US and the USSR. The much higher ratio of residents to rooms in the USSR meant that the couch from which USSR residents watched television typically also served as a bed where the residents slept at night.

[17] Robinson and Godbey, Table 9, p. 145.

[18] Robinson, John P., Vladimir G. Andreyenko, and Vasily D. Patrushev, *The Rhythm of Everyday Life* (Boulder, Co: Westview Press, 1989) Table 5.3, p. 93. Other estimates from other cities in the USSR in the early 1980s are somewhat lower. For Kerchi in 1982, average television viewing time for men and women was 13.7 and 11.5 hours per week respectively. See Patrushev, V.D., "Svobodnoe Vremja Gorodskogo Naselenija: Prodolzhitelnost, Mesta I Sotsialnoe Okruzhenie ego Provedenija," in *Robochee I Svobodnoe Vremja* (Moscow, 1987), p. 22.

[19] More narrowly focused communications research has shown that television viewing time depends significantly on daily habits and rituals not closely related to programming content. See e.g. Rubin, A.M.,

Growth in discretionary time is closely related to growth in media use, particularly time spent watching television. Table 1 shows trends in media use and discretionary time in the US from about 1925 to 1995. The share of discretionary time allocated to media grew from about 25% in 1925 to about 50% in 1995. But the power of the new media on ordinary persons' time has operated in a particular way. Note that time spent reading newspapers did not change significantly between 1925 and 1965, and discretionary time allocated to non-media activities has changed little between 1925 and 1995.[20] Most of the increase in media usage since 1925, in particular television viewing, is accounted for by increases in discretionary time.[21] Historically, the growth in time spent with television has largely come from growth in discretionary time.[22]

Table 1
US Trends in Media Use
Based on Time Studies
(hours per week as primary activity)

	Year		
Time Use	c. 1925	1965	1995
Reading	6	4	3
Newspapers	2.5	2.5	0.8
Television	0	10	16
Other Media	1	1	1
Total Discret. Time	26	35	41
media time	7	15	20
non-media time	19	20	21

Growth in discretionary time and development of new habits for occupying time are probably more important than compelling content for the development of the digital

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"Ritualized and Instrumental Television Viewing," *Journal of Communication* v. 34 n. 3 (1984) pp. 67-77; Jeffres, L.W., "Cable TV and Viewer Selectivity," *Journal of Broadcasting* 22 (1978) pp. 167-177.

[20] In an impressive body of work, Robert Putnam has documented and explored a decline in civic participation and social connectedness ("social capital") since the 1950s and 1960s. He argues that television watching has been a major cause of the decline in social capital. Table 1 shows that there has not been a decline in discretionary time spent in activities other than media usage. Hence the effect of television must not be primarily via time displacement. For evidence of other types of television effects, see Cambell, David E., Steven J. Yonish, and Robert D. Putnam, "The American Viewer: The Multifaceted Relationship Between Television and Civic Engagement," Paper presented at the 1999 Annual Meeting of the American Political Science Association, available on the web at http://www.people.fas.harvard.edu/~dcampbel/papers.htm .

[21] In the US from 1925 to 1995, time spent reading fell about 2 hours, television viewing grew to 16 hours, and discretionary time grew by 15 hours. While these facts have been established only for the US, trends in time use in other developed countries are probably similar.

[22] Radio's place in the allocation of discretionary time is more complex than that of television. In time budget surveys, radio listening is primarily reported as a secondary activity. The development of radio expanded the possibilities for secondary activity, i.e. listening to the radio while driving by oneself. This is a different dimension of effective growth in discretionary time.

economy. An insightful industry analyst has argued strongly that, in terms of economic value, content is **not** king.[23] Recent industry developments seem to support that analysis.[24] Content can provide inspiration, education, and degradation, it can promote social justice, better public policy, and existing cultural stereotypes, and it can make and break the images and fortunes of politicians and other public figures. But content may not be even a major factor in determining the aggregate revenue of media industries. Television, radio, and newspaper have succeeded economically primarily by cultivating favorable habits of use, and the same is likely to be true for new media.

II. Advertising's Share of the Economy: Constant Long-Term

Attention is an important dimension of activity independent from time. Time and attention tend to be positively related. Spending time often serves as a sign or measure of attention, while a given level of attention becomes more significant the longer amount of time over which it is sustained. Nonetheless, time and attention cannot be reduced to measures of one or the other. The level of attention can differ significantly over different time periods. Moreover, the distribution of attention over time matters in describing the nature of activity; a sleeping person might have enough attentiveness to perceive the sound of an alarm clock, but no matter how long the person slept she would not notice an advertisement placed on the wall. Thus attention is an important aspect of describing and measuring personal activity.

Advertising spending provides a measure of commercial efforts to attract attention through media messages. Of course the desire to attract attention is an aspect of human nature, and techniques for attracting attention have been at the core of education and intellectual life for millennia. Economic development has provided new incentives for attracting attention, and media development has provided new tools. Advertising spending is a measure of efforts to attract attention in a particular way to particular goods.

While the development of radio and television has provided important new media for advertising, total advertising spending as share of the economy has been constant long-term. Chart 1 shows US advertising spending, including direct mail advertising, as a share of the economy's overall output (GDP) from 1925 to 1999.[25] The advertising share dropped sharply, and not surprisingly, during World War II, and experienced a dip in the

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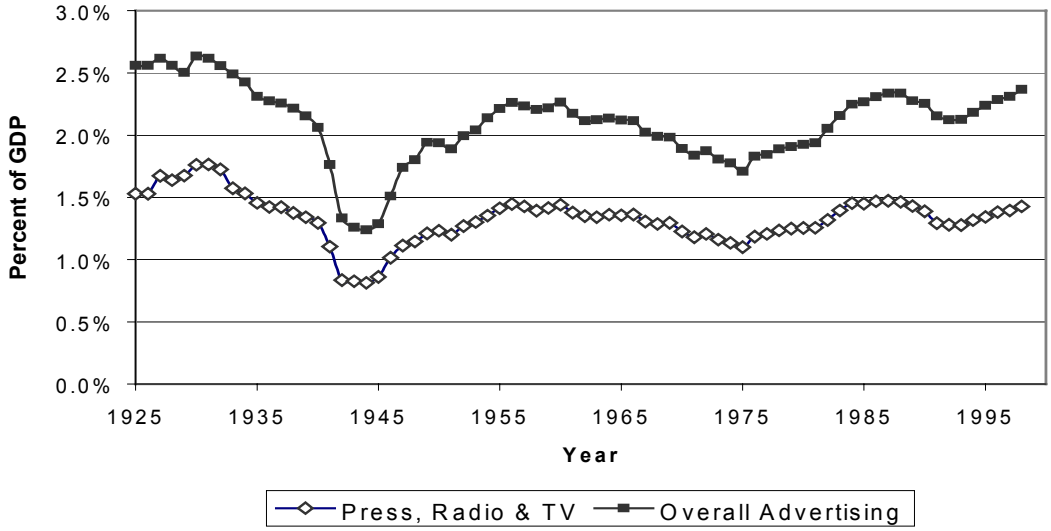
[23] Odlyzko, Andrew, "Content is Not King," First Monday, vol. 6, no. 2 (Feb. 2001), on the web at http://www.firstmonday.org/issues/issue6_2/odlyzko/index.html .

[24] There have been widespread failures in content-oriented websites. Feed (http://www.feedmag.com), one of the Web's earliest general interest publications, recently shut down for financial reasons.

[25] The US Census Bureau has published figures for the total volume of advertising 1867 to 1970. See *Historical Statistics,* Series T 444-471. These statistics represent the work of Robert J. Coen of McCann-Erickson Worldwide. He has made subsequent figures available on the web and in *Advertising Age*. See http://www.mccann.com/html/coenreport.html . The advertising statistics prior to 1935 have been subject to considerable criticism and revision. See Pope, Daniel, *The Making of Modern Advertising* (New York: Basic Books, 1983) pp. 21-28 and Simon, Julian L., *Issues in the Economics of Advertising* (Urbana: University of Illinois Press, 1970) pp. 187-8 and Table 3.3. I have used Coen's figures from 1935 (including direct mail) and Borden's figure for 1925 (op. cit. p. 48 (Table 1) and p. 57 (Table 3).

Chart 1: U.S. Advertising Spending as Share of Output



late sixties and early seventies. There is no evidence of a long-term upward trend. As Table 2 shows, overall US advertising spending as a share of GDP was 2.6% in 1925 and 2.4% in 1998. Similarly, UK advertising spending as a share of GDP is roughly horizontal in the long run, with a somewhat greater reduction associated with World War II.[26] UK advertising as a share of GDP was 1.7% about 1925 and in 1998.[27] The advent of radio and television does not appear to have influenced total spending on advertising relative to over-all economic activity.[28]

[26] Looking at advertising spending shares from 1948 to 1999 (*Advertising Statistics Yearbook 2000*, Table 2.1) is misleading because World War II depressed advertising spending significantly.

[27] UK advertising spending data for 1925, 1938, and 1952 are from Silverman, Rodney, *Advertising Expenditure 1952* p. 1, p 24 (Table 2). The 1925 figures represent informed estimates. The 1998 data are from the Advertising Association. See http://www.adasoc.org.uk/inform/stats.html .

[28] Members of the advertising profession and scholars of advertising in the US have struggled with these facts since the late 1950s. David M. Blank, the Director of Economic Analysis for CBS, a major US television network, noted in 1963 that certain early advertising figures were overstated. He argued that a better understanding of the facts and of the factors that affect advertising indicated that advertising would continue to rise in relative importance. See Blank, David M., "A Note on the Golden Age of Advertising," *Journal of Business*, vol. 36 (Jan. 1963) pp. 33-38. A thorough study published in 1970 reached a similar, although somewhat more tentatively expressed, conclusion. See Simon, pp. 187-192. Simon shows (pp. 167-187) that, looking across countries will huge difference in per capita income (from Pakistan to Sweden), advertising's share in GDP tends to rise with per capita GDP. This is an aspect of economic development not captured in US and UK trends from 1925 to 1998. UK observers have also noted the long-term constancy of UK advertising relative to the size of the UK economy. See Halstead, Sir Ronald, "The Effect of Television on Marketing," p. 410-11 in Brian Henry, ed., *British Television Advertising: the first 30 years* (London: Century Benham, 1986).

Table 2
Advertising's Share of the Economy
(ad spending as % of GDP)

Location/Type	Year			
	1925	1938	1952	1998
UK				
Press	1.2%	1.0%	0.7%	0.9%
Radio & television	0.0%	0.0%	0.0%	0.5%
Other	0.5%	0.5%	0.3%	0.3%
Total	1.7%	1.5%	1.0%	1.7%
US				
Press	1.5%	1.2%	1.0%	0.7%
Radio & television	0.0%	0.2%	0.3%	0.7%
Other	1.0%	0.9%	0.7%	0.9%
Total	2.6%	2.2%	2.0%	2.4%

The large differences in the development of commercial radio and television in the UK compared to the US have produced only subtle changes in aggregate advertising spending. Despite much stronger focus in the UK on public broadcasting and much slower development of private broadcasting, in both the US and the UK radio and television advertising amounts to about 30% of total advertising. In the US the advent of radio and television shifted about half of the print advertising share to these new media. In the UK the growth in radio and television advertising came about equally from the shares of print and other media. Overall, print, radio, and television advertising in the US and UK amount to about the same shares of GDP. The most dramatic differences between the US and the UK are the much greater significance in the US of direct mail advertising, directory advertising, and other media. These differences existed before 1938, and hence they are probably not a feature of the growth of radio and television.

The long-term constancy of advertising spending relative to total output suggests that advertising revenue will not drive relative rapid growth in the digital economy. Radio and television, dramatically new media, did not affect the relative amount of revenue generated by advertising. Such evidence is good reason to think that in the future new media technology, such as broader bandwidth and more interactivity, will not affect revenue flow from media advertising. New media can attract advertising revenue from old media, but the historical evidence also suggests that aggregate changes in the composition of advertising spending are likely to be slow. Relatively rapid revenue growth in the digital economy will have to come from sources other than advertising spending.

III. Real Advertising Spending Per Media Hour: Constant Long-Term

Internet advertising presented the promise of a more powerful form of media advertising. Internet advertising provides for interactivity in advertising, permits much more information to be made available to interested potential customers, and also enables more specific and sophisticated discrimination and segmentation of advertising audiences. How important are such technological developments likely to be in creating value in media advertising?

The historical record shows that the growth of radio and television has not significantly changed real advertising spending per media person-hour. Advertising is typically purchased in terms related to persons reached and extent of exposure. Table 3 provides this sort of calculation for US newspaper, magazine, radio, and television advertising from 1925 to 1995. The hours figure for 1925 has significant uncertainty, and reasonable different estimates for it would change real media spending per hour in 1925 by –25% to +50%. Given that real income probably increased by a factor of twenty between 1925 and 1995, the difference in real advertising spending per media hour across this period is astonishingly small.[29]

Table 3
US Real Advertising Spending/Media Hour
(print, radio, & TV)

	Year		
	1925	1965	1995
Media Hours/Person-Year	208	728	962
Persons Ages 15-64 (ths.)	73,342	115,752	171,676
Ad Spending/Year (mil.)	$1,433	$9,761	$97,622
Purchase Power of $ (1998=1)	9.50	5.28	1.09
Real Ad Spending/ Media Hour (1998 $/mil. hrs)	**$0.89**	**$0.61**	**$0.65**

This evidence suggests that new media have not provided advertisers with a distinctively powerful tool for gaining persons' attention. Real advertising spending per media hour indicates the average value to advertisers of ordinary persons' time with media. If television represented a dramatic change in technology for gaining attention, one might expect to see advertisers spending significantly more per media hour when television viewing dominates media usage. The evidence does not show this. One might also expect to see more advertising spending per media hour when the stakes – the average

[29] Real US GDP from official statistics shows about 10-fold growth from 1925 to 1995. See *Statistical Abstract*, Table 1434. Brad DeLong's more extensive consideration of the standard of living indicates that real GDP may have increased about 20 times from 1925 to 1995. See Delong, J. Bradford, "Cornucopia: Increasing Wealth in Twentieth Century," available online at http://www.j-bradford-delong.net/TCEH/2000/TCEH_2.html .

income level of consumers – are higher. The evidence does not show this. Instead, comparing 1995 to 1925, about the same level of advertising spending per hour is applied to about 4.6 times as many media hours. The growth of television proceeded with an accumulation of advertising time, not with an increase in advertising spending intensity.

The historical evidence suggests that media technology does not strongly affect the value associated with attracting attention to media. There are many possible explanations for this historical regularity. Perhaps the best explanation is that most media, even technologically simple ones, can effectively support the most important aspects of media advertising, such as evoking emotional images and aspirations and providing some but not too much relevant information. Greatly improving the technology of media advertising probably won't greatly enhance its value.

IV. Looking for the Future of Media and the Digital Economy

Factors important for the success of a particular media company shouldn't be conflated with factors important to the growth of the digital economy as a whole. Newspaper content may be important for the competitive position of one newspaper relative to another. Programming may explain why one television channel attracts a larger audience than another. Media technology may make one advertising channel more attractive than another. Yet the historical evidence suggests that neither content nor media technology has strongly affected the over-all economic shape of media industries. More attractive media content and more sophisticated media technology are unlikely to drive over-all growth in media industries and the digital economy.

The growth of the digital economy is likely to depend on growth of discretionary time and integration of digital technology into new forms of socializing, transacting, and spending time. Reductions in hours of paid work have been an important historical source of increases in discretionary time, but other social and economic changes also shape time use. New forms of transportation and increased travel time have created new time for car radio listening, wireless telephone conversations, and in-flight entertainment. Other technological developments have created other possibilities for media use. The Internet has enabled globally accessible discussion forums that attract a large number of diverse participants.[30] Online auctions have effectively created wide-area garage sales that have generated a large number of transactions.[31] Online gaming attracts loyal and

[30] For examples of discussion forums see Plastic, http://www.plastic.com (discussion of content made available elsewhere on the web), Backwash, http://www.backwash.com (discussion organized around personality types), the Fray section of Slate, http://www.slate.com (discussion linked to content of online magazine), and the discussion section of the Atlantic Monthly, http://www.atlanticmonthly.com (discussion linked to the online version of a print magazine).

[31] eBay (http://www.ebay.com) is a leading online auction site, and online pioneers Amazon (http://www.amazon.com) and Yahoo! (http://www.yahoo.com) also provide auctions. There are also a large number of more narrowly focused auction sites.

enthusiastic participants who create sub-cultures around particular games.[32] As silly as it might seem to some, the success of video on demand may depend less on technology and content availability than on adequately replacing the perceived sociability of persons going together to a video store to look over pictures on empty boxes to select a movie to watch.

The most important characteristic of the new digital economy may be the increasing dependence of revenue on personal habits and norms rather than on the characteristics and values of products. While transactions for physical goods are simple and well-recognized, services compete in a much broader field of human interactions. Those selling services need to establish acceptance among persons that a particular service is the sort of thing that one fairly pays for in a given way. Persons are accustomed to paying for traditional utilities, like telephone service or electricity, according to monthly bills that are difficult to understand and verify.[33] On the other hand, getting persons to pay for e-mail, an extremely valuable service, is probably not a feasible business challenge. New digital services need to create new payment habits and norms in a commercially driven environment. This is the major challenge of the new economy, and it is a challenge with much broader scope than inventing a business plan.

[32] See the material available at the Online Gaming League's website, http://www.worldogl.com/ and at the GameFAQs site (http://www.gamefaqs.com), such as the forum on Starcraft: Brood War (http://cgi.gamefaqs.com/boards/gentopic.asp?board=22945).

[33] Most persons do not have meters that indicate the quantity of electricity or gas purchased. Telephone bills often included a variety of charges that customers do not understand.