

CONSUMER TECHNOLOGY

PURCHASE BEHAVIOR IN THE 1990s

Consumers are notoriously fickle when it comes to purchasing new high-tech products. For example, computer and consumer electronics industries attach great importance to “user-friendliness” as a critical success factor, yet even the most cursory glance at the last two decades of hits and failures suggests that this is only part of the whole user equation. There are multiple instances of user-friendly products that nonetheless were market duds, including RCA’s DiscoVision (an early laserdisc system), numerous home computers, and a host of consumer electronics gadgets such as voice-controlled telephones, home fax machines, smart appliances, and pocket-sized xerographic copiers.

At the other extreme, there is no shortage of instances when complex products have gone on to market success. The majority of consumers today have no clue how to use even a fraction of the features on their VCRs, or navigate the maze of buttons on the average TV remote. The most glaring exception is the personal computer itself. If “ease of use” is so important, then how did the IBM PC—a notoriously cranky, unfriendly and arbitrary device—ever emerge as the market leader? Even today, when interfaces (windows, icons, mice, and pull-down menus) theoretically are available to more users than ever, the majority of machines on our desktops still run plain old DOS. If ease of use and user-friendliness were all-important, we would all have abandoned DOS PCs long ago.

The problem is that ease of use and user-friendliness encompass only part of the usefulness equation, not only in computing but the entire high tech product sector. In the case of DOS PCs, we make do with our old machines because we are a frighteningly adaptable species. A good tool should adjust itself to the user, but good tools are scarce, and so we have learned to happily adapt ourselves to all but the most awkward of gizmos. Computers are especially ungainly devices, and so manufacturers count on users to meet their incomplete inventions more than halfway. The happy captives are said to be “computer literate”—tame and tractable and expert at making up for the manufacturers’ design failings.

Of course there are limits to what computers can expect their human companions to put up with. We don’t use tools simply because they are friendly. We use tools to accomplish tasks, and we abandon tools when the effort required to make the tool deliver exceeds our “threshold of indignation”—the maximal amount of behavioral compromise we are willing to make in order to get a task done.

This measure of Threshold of Indignation completes the usefulness equation, capturing both the importance of the task we are trying to complete, and the user-friendliness of the tool we are trying to complete it on. In the case of the PCs in our offices, computers don’t have to be friendly at all if the task is important enough and we have no alternative. Knowledge workers

suffering from CRT eye-strain and repetitive motion syndrome understand intuitively that this extreme is the unfortunate norm in the business world. Our business culture gives office workers relatively high thresholds of indignation.

In contrast, consumers have extremely low thresholds of indignation. Even the friendliest of information appliances will gather dust if the task bores us. The majority of VCR owners never venture beyond the play button on their machines because they have no practical use for the fancy features. Small wonder that the market for home computers is confined largely to students and business people overworking at home in the evenings—individuals who are bringing their high business thresholds home.

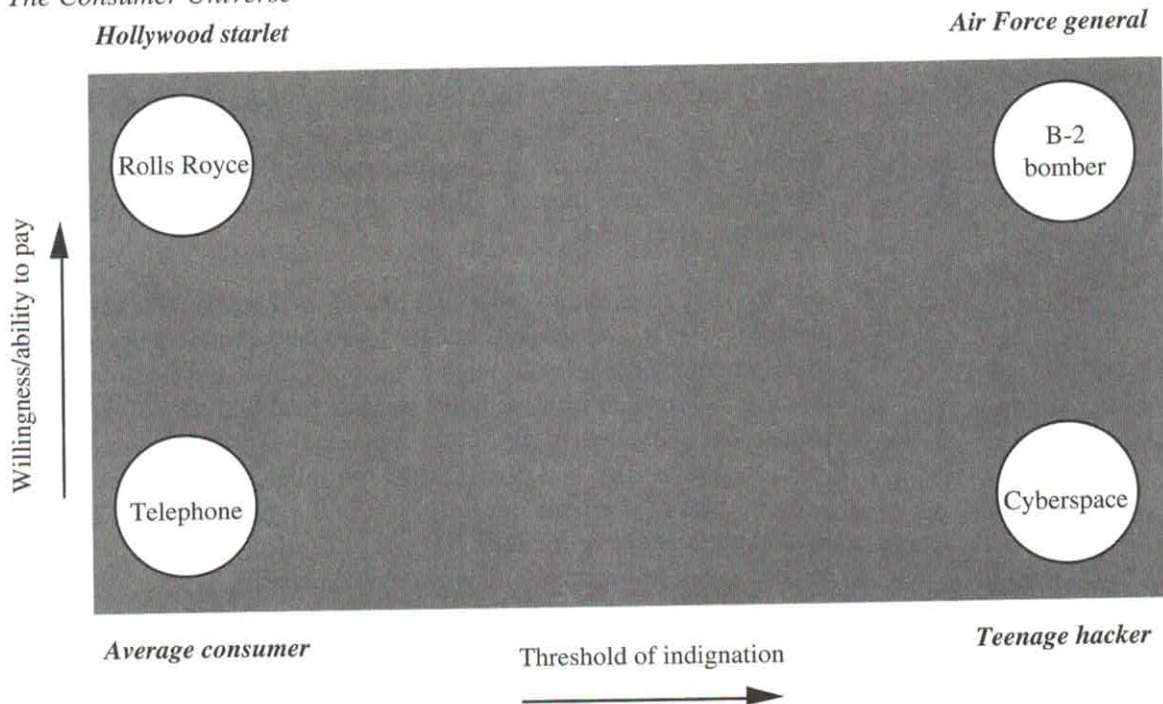
The threshold of indignation measure also has more general application beyond information technologies. Experience with other devices can help us better understand the full range of potential consumer behavior better. For example, cultural familiarity with a technology also influences the threshold. Automobiles are even more user-hostile than PCs. They are complex to maintain and hazardous to operate, regularly killing and maiming scores of innocent citizens. Yet automobiles seem user friendly because we have spent a lifetime assimilating a host of automobile skills, including pumping gas, conversing with mechanics, learning the intricacies of the vehicle code, and understanding automotive loan financing. Similarly, our telephone system has become steadily more complicated since divestiture, yet we have barely noticed because our learning curve has kept pace, raising our collective threshold of indignation. We have all become operators, internalizing the complexities of direct dialing, calling cards, and access codes.

As this latter example suggests, thresholds of indignation also can change over time. A 1920s time-traveler would be lost in the touch-tone complexities of our 1990s phone system. Yet if we traded places, we would be equally confused and infuriated by endless and time-consuming transactions with human operators. This shift is reflected in differing generational responses to technologies today. Baby boomers prefer the efficiency and anonymity of bank ATMs, while their parents avoid these banking robots in order to conduct their transactions through a human teller.

MODELING THE UNIVERSE OF TOOLS AND USERS

One final piece completes this equation—ability and willingness to pay. As depicted in Figure 69, one can model the entire consumer universe along this and the threshold of indignation dimensions. The full range of consumer responses and the products they are willing to purchase are indicated in each of the four corners, described below.

Figure 69
The Consumer Universe
Hollywood starlet



Source: IFTF

- *The Air Force general*—infinite wealth matched only by an infinitely high threshold of indignation. Imagine a device that is infinitely expensive and infinitely complex, and you have described the B2 “Stealth” bomber with all the latest in high-tech trickery, pound-for-pound costing *more* than its weight in gold. There is only one consumer with both the cash and the requisitely high threshold of indignation required to own one of these babies. Even NASA can’t match either the buyer or the product with its nearly as complex high-tech toy, the Space Shuttle.
- *The teenage hacker*—a general’s love of complexity, but no cash. Now imagine a device as impenetrably complex and confusing as a B2, but accessible to someone without any money at all. The “device” is “cyberspace”—today’s confusing maze of networks and electronic highways connecting computers worldwide. Cyberspace is so confusing that only two kinds of individuals take the time to understand its intricacies, computer scientists and teenage hackers. For the latter, cyberspace’s sheer mind-numbing complexity makes it an irresistible electronic playground accessible with a miniscule investment in a PC and modem. For more than one hacker, cyberspace has become a license for obsession, tracking down links and exploring its most obscure corners.

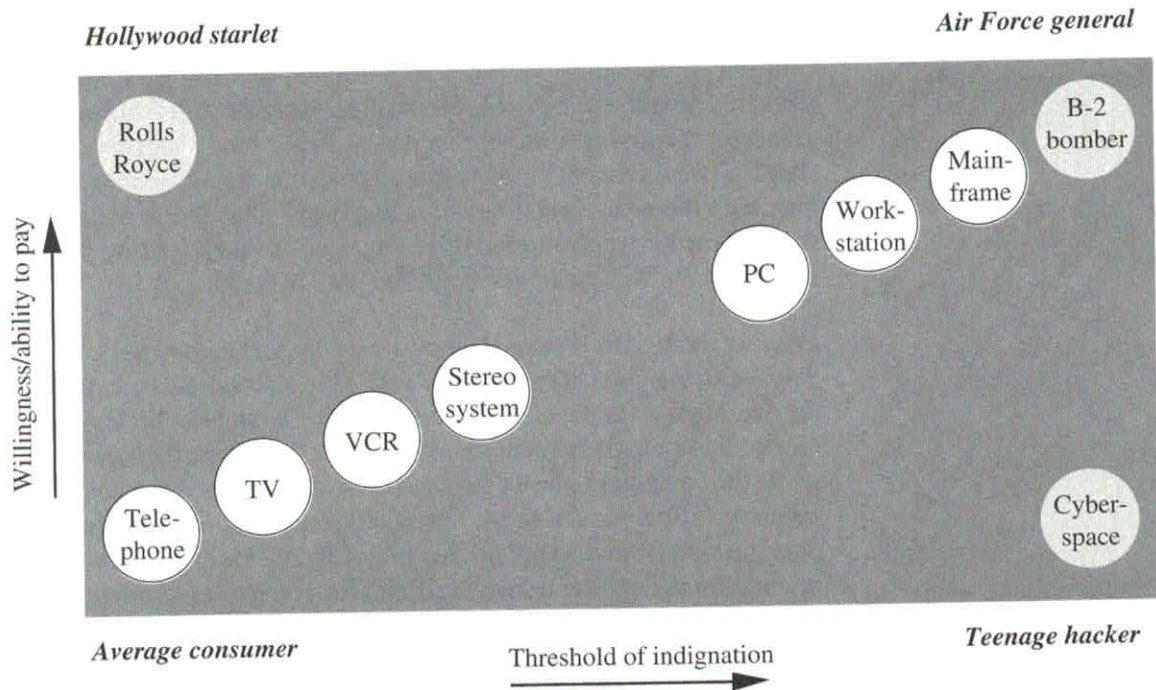
- *The Hollywood starlet—lots of cash and utterly no patience.* Who has endless wealth, but no patience with even the simplest of devices? Zsa Zsa Gabor's on-stage personality nicely matches this intersection, so we generalize this quadrant as that of the Hollywood starlet. The perfect consumer toy for such bored rich is of course, a Rolls-Royce. And if it is too complex to drive, then so much the better. Just throw in more cash for a chauffeur, at once simplifying things and adding to the price! "Home theater" systems today are the Rolls Royces of consumer electronics.
- *The average consumer—some cash and some patience.* Finally, there are the rest of us, average consumers with some cash and some patience. Consumers love novelty as much as the other three, but a combination of cash and time constraints limits our purchasing flights of fancy. If something delivers benefits (either functional or entertainment) without too much work and doesn't cost too much, we will make it an integral part of our lives. A telephone is the model product for this quadrant: it is cheap (under \$100), easy to use (just plug it in) and delivers real, immediately understandable benefits.

A SNAPSHOT OF HIGH-TECH PRODUCTS TODAY

By filling in the matrix with an assortment of products being sold today, one can quickly get a sense of where one zone transitions into another. Figure 70 shows such a high tech spread for the consumer (left half of diagram) and business (right half of diagram) worlds. On the business side, PCs are the simplest and cheapest of the devices depicted, and most easily understood by the individual worker. Workstations are slightly more expensive and complex because they must be connected into a network managed by system professionals. Mainframes are more remote and complex yet, while cyberspace is all but invisible to everyone except an anointed few. In fact, one can describe each of these products along purely functional lines that have nothing to do with the technology. A PC is a device an individual user can turn on and off, and add and remove software at will. With a workstation, the user can control the on/off switch, but must ask someone else's permission before messing with the software. And a mainframe is a device one can approach only through bureaucracy.

The same principles apply on the consumer side. A telephone is solidly in the consumer quadrant by virtue of its low cost, clear benefits, and ease of use. TVs are a bit further out on both axes, more costly and harder to use because one must hook them to AC power, an antenna, or cable and then navigate through an ever growing number of channels. VCRs fall yet further out. Though VCR prices are about the same as TVs, their complexity falls well beyond the few features that most viewers actually use. Component stereo systems fall at the edge of the consumer quadrant. Not only are the pieces expensive, but set-up involves puzzling out a tangle of

Figure 70
The High-Tech "Spread"



Source: IFTF

wires, setting custom preferences and then learning how to use obscure and confusing remote controls. Fortunately, many consumers live in families that typically include individuals farther along one axis than the other members. As a team, they can make product desires a reality. Mom and Dad do the purchasing, while their more technology-tolerant children install the stereo or perform the intricacies of VCR programming.

IMPLICATIONS

This model can help explain consumer trends, and in specific instances, even predict a product's chances of success or failure. What follows are a few of the more interesting implications from a variety of perspectives.

- *High-tech products tend to move downward and left over time.* It is axiomatic that the cost of high tech components drop rapidly over time, and the performance of new components increases. For example, Moore's Law (named after Intel co-founder Gordon Moore) states that the cost of a given unit of processing power on a chip decreases by a factor of 10 every two-and-one-half years, while the number of circuits that one can fit in a given space (an indirect measure of performance) increases at the same rate. The dropping cost factor means that high tech products will move downward on the map over time. The rising

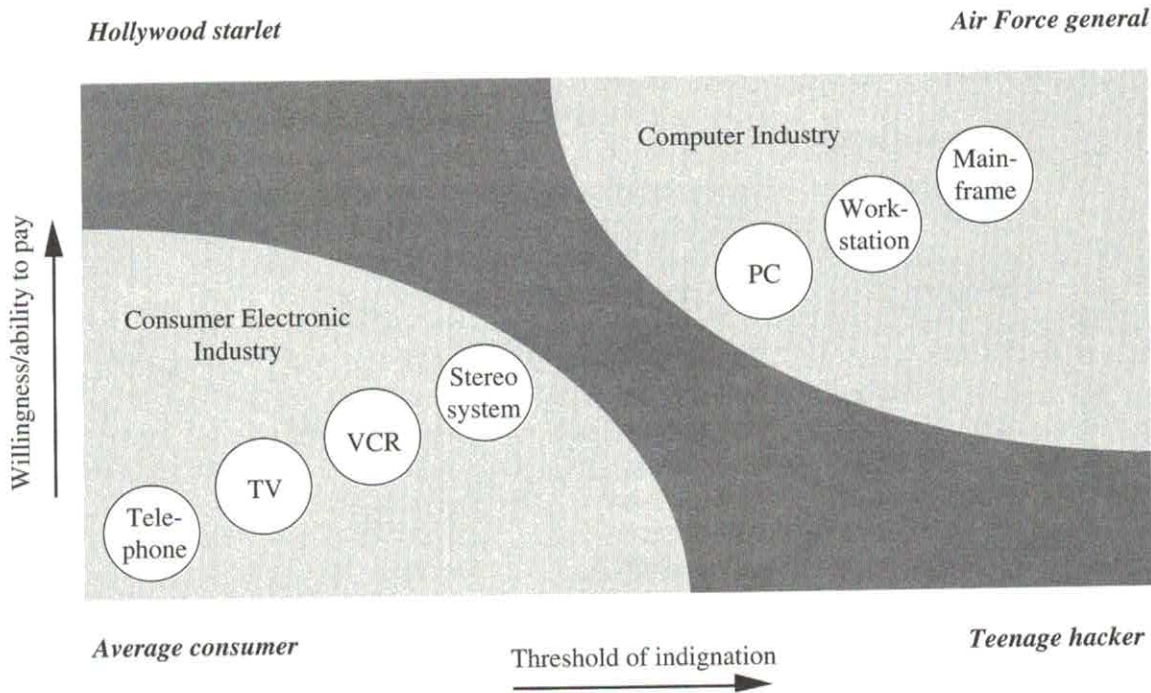
performance factor tends to push products left along the indignation curve because it takes extra power to make devices user-friendly.

- *Consumer thresholds tend to rise over time.* As mentioned earlier, consumers become accustomed to particular technologies and their threshold of indignation rises. Newfangled phones once frustrated our grandparents; today's more complex systems rarely annoys us. In short, we evolve with our technologies, our rising sophistication matching the new capabilities of technology. This factor adds some force to the leftwards motion of products on the map—rising sophistication alone will make devices more user-friendly.
- *Product manufacturers tend to be tuned to particular zones on the map—and moving is remarkably hard.* One also can place industries on this map, as depicted in Figure 71. For example, the consumer electronics industry is focused on the lower left (consumer) quadrant, while the computer industry centers on the upper right quadrant. Each industry is finely tuned to the specific threshold of indignation of its core customers, and to the price point of its mainline products. This orientation makes it extremely difficult for companies to move out of their new areas because doing so requires new understandings about unfamiliar levels of indignation thresholds, and reorienting entire manufacturing and sales processes to a different price granularity of product.

In this latter regard, companies are like villages that hunt different kinds of game for their food. One village might hunt mammoths, depending on one kill every six months. Another might depend on weekly deer hunts, and a third might be inhabited by rabbit-eaters, who must come home with game every day in order to survive. In high-tech industry today, aerospace firms are mammoth hunters, personal computer companies are deer hunters, and consumer electronic firms are rabbit hunters. Just as mammoth hunters might find rabbit hunting demeaning and hard, aerospace companies are unlikely to invent the consumer electronic successor to the VCR even though they pioneered many of the components VCR makers incorporate into their products.

- *It is easier for companies to move right or up than down or left.* All things being equal, it is easier to move into customer populations with higher indignation thresholds, than the opposite. And selling more expensive products, while difficult, is far easier than selling cheaper products. This is dramatically demonstrated by the inability of US computer manufacturers to play a significant role in the fastest growing part of the personal computer industry—laptops. Laptops are priced like consumer electronic commodities, but built with a complexity equal to that of a PC. Consumer electronics understand this sort of

Figure 71
Where Industries Fit on the Matrix



Source: IFTF

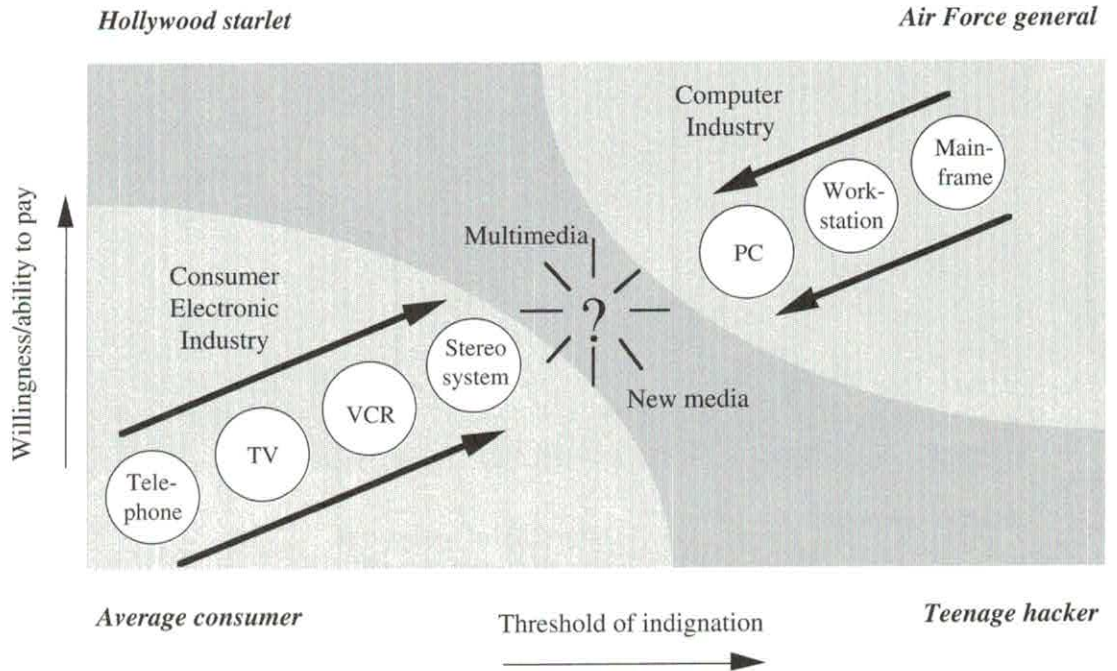
market. They are not frightened by high volume, low margin manufacturing and sales and as a result have dominated the laptop market.

Moving down or left is like trying to swim to the bottom of a pool while wearing a life vest. By paddling furiously, one can get partway down, but eventually, one will bob back to the surface. Similarly, a few very aggressive companies can move down one level, but they rarely get further. IBM's move into PCs in the 1980s is a case in point. Though IBM made "big iron"—mainframes and the like—the infant PC sector was a close neighbor that the company was able to greet by virtue of good executive decisions and visionary managers. But IBM's next step down, into home PCs with the PC Junior was a singular disaster because the consumer-level prices and threshold of indignation were too alien.

- *The most important product opportunities will be gaps immediately adjoining a company's core markets.* New companies can look anywhere on the matrix that seems to fit their capabilities, but established companies should seek out gaps close to home—a pattern reflected by Apple's and IBM's respective entries into personal computing. The biggest gap in the high tech sector today lies in the center of the matrix,

as depicted in Figure 72. This gap seems to be the center of the current quest for a Multimedia or New Media industry in the making.

Figure 72
Where Today's Technology Fits on the Matrix



Source: IFTF

Viewed on this matrix, it becomes apparent that multimedia is not merely a cap next to personal computing, but the likely collision point between upward- and rightward-moving consumer electronics companies, and downward- and leftward-moving computer manufacturers. If the model has any predictive value, it is a sure bet that the consumer electronics players are the most likely to win, though as discussed in "Industries at the Edge," the ultimate winners will require understandings from both sides of the gap in order to succeed.

— Paul Saffo