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Our Ratings, Ourselves

By JON GERTNER

The Mismeasure of TV

One of the great contradictions of modern American life is that almost everyone watches television while almost no one agrees anymore about what it really means to watch television. True, we know that as spring gets under way, new episodes of "Desperate Housewives" and "C.S.I." and "American Idol" will battle for prime-time supremacy in the overnight Nielsen ratings. We also know that local broadcast stations around the country will begin scheming -- just as they do every April -- to win the May sweeps, the tense weeks when rival stations pursue a fierce one-upmanship of flamboyance and hype and the Nielsen-measured audience sizes determine future advertising rates. But when it comes to figuring out how many of us are watching these shows, and whether we're paying attention while we're watching and even whether we're actually noticing the advertisements among the shows we may or may not be watching -- well, this is where things get tricky.

For the past decade or so, watching television in America has been defined by the families recruited by Nielsen Media Research who have agreed to have an electronic meter attached to their televisions or to record in a diary what shows they watch. This setup may not last much longer. Just as programmers and advertisers are clamoring for a better understanding of the television audience, a wave of new consumer products has made it increasingly difficult to satisfy them. One day this January I sat in a Greenwich Village workroom with Bob Luff, the chief technology officer at Nielsen, as he pulled out gadget after gadget to show me what he's up against. Luff seemed to view the modern American home as a digital zoo where the lion is about to lie down with the lamb: radio is going on the Web, TV is going on cellphones, the Web is going on TV and everything, it seems, is moving to video-on-demand (V.O.D.) and (quite possibly) the iPod and the PlayStation Portable. "Television and media," Luff said over the noise of five sets tuned to five different channels, "will change more in the next 3 or 5 years than it's changed in the past 50."

It is Luff's job to think this way, of course -- to observe Americans' embrace of new technologies and respond with new ways for Nielsen to measure that. It is also the job of a Maryland company called Arbitron, which has counted radio listeners -- and, at various times, television viewers -- since the late 1940's. For the past few months, Arbitron has been taking a distinctly unorthodox approach to measuring audiences. Currently the company is recruiting a couple of thousand volunteers in Houston and asking these randomly chosen men, women and children to wear a black plastic box that looks like a pager, three inches by two inches by one-half inch, whose circuitry is roughly as complex

as that of a cellphone. In the radio and television industry, this little box is known as the portable people meter, or the P.P.M. In both a business and a cultural sense, it also seems to be the equivalent of a large explosive.

The Houston volunteers will clip the P.P.M.to their belts, or to any other article of clothing, and wear it all their waking hours. Before going to bed, the volunteers will be expected to dock the P.P.M. in a cradle so that overnight it can automatically send its data to a computer center in Maryland, where statisticians can download and review the information. There are still kinks to work out, but ideally the P.P.M. will tell Arbitron exactly what kind -- and exactly how much -- television and radio programming a person was exposed to during the day. Eventually the P.P.M. may also tell the technicians at Arbitron a host of other things too, like whether a P.P.M.-wearer heard any Web streaming, or supermarket Muzak, or any electronic media with audible sound that someone might encounter on a typical day.

It may not be immediately obvious why this little gadget should matter much to anyone beyond East and West Coast media elites. But one indisputable fact about media measurement is that if you change how you count, funny things happen. Or maybe not so funny. Nielsen's introduction of new electronic television meters in the New York area last winter, for instance, prompted a torrent of criticism from Fox Television, which saw the local ratings (and potential revenue) of several of its programs suddenly plummet. But this may prove a modest dust-up compared with what comes next, if devices like the P.P.M. or data from millions of set-top digital cable boxes reveal that what Americans are seeing and hearing do not correspond to what the big measurement companies have long been claiming.

Finding out whether "C.S.I." beats "Desperate Housewives" is just the beginning. Change the way you count, for instance, and you can change where the advertising dollars go, which in turn determines what shows are made and what shows then are renewed. Change the way you count, and potentially you change the comparative value of entire genres (news versus sports, dramas versus comedies) as well as entire demographic segments (young versus old, men versus women, Hispanic versus black). Change the way you count, and you might revalue the worth of sitcom stars, news anchors and -- when a single ratings point can mean millions of dollars -- the revenue of local affiliates and networks alike. Counting differently can even alter the economics of entire industries, should advertisers (thanks to the P.P.M.) discover that radio or the Web is a better way to get people to know their brand or buy their products or even vote for their political candidates. Change the way you measure America's culture consumption, in other words, and you change America's culture business. And maybe even the culture itself.

The Code for All Media

Among the bedrock beliefs of the measurement business is the notion that a "passive" measurement device is more accurate than an "active" one. This is another way of saying that the more that volunteers have to do to actively chronicle their program choices, like pushing a button or writing something down, the less exact the information about the

audience will be. For years, Arbitron's radio ratings and Nielsen's television ratings have depended on selectively recruited Americans who usually get between $2 and $15 to fill out weekly paper diaries in hundreds of local media markets around the country. The diaries are a highly active form of measurement, subject both to frequent errors of recollection (you tend to forget that you stopped on the Weather Channel for four minutes while flipping to another program) and to the human tendency to champion personal or habitual favorites (you might write down "The Daily Show" even if you were out of town that night). A diary can measure only what a person says he watched or heard. It can never reliably measure what everyone actually watched or heard.

The distinction matters. It's why, in the late 1980's, Nielsen first began to switch to a new electronic meter, the People Meter, which automatically notes what channel a television set is tuned to and can also register who watches, as long as each viewer presses a log-in button. This gave Nielsen (and, in turn, television programmers and advertisers) a wealth of new information. Thanks to the company's recruitment techniques, which included interviews and surveys of every prospective household, Nielsen could match the shows each viewer watched to his or her age, income and ethnicity.

In those days, Nielsen's only competitor in the television ratings business was Arbitron, which had already carved out a lucrative niche measuring radio audiences but was struggling to compete with Nielsen in local TV markets. In fact, by the early 1990's, Arbitron, which also built electronic meters to monitor television sets, was worried that the business was becoming prohibitively expensive. So in early 1992, Arbitron's top executives called in their chief engineer, Ron Kolessar, and asked him to come up with an answer to this problem. Could Kolessar find a less expensive way to measure television and radio audiences at the same time? Also, could he make the measurements better too?

Kolessar gathered his staff in an office in the summer of 1992 to toss around ideas and to periodically scribble the good ones down on a white board. In the beginning, of course, the engineers in the room were simply trying to satisfy their bosses -- to find a cheaper and more efficient way to evaluate Americans' TV and radio habits. The engineers figured they might, if they were lucky, come up with a way to make Arbitron competitive with Nielsen again. But their thinking soon changed. As they worked on their project, Kolessar and his team could see that they were trying to understand, and perhaps to shape, the future of media and advertising in America. When Kolessar finally made a presentation to Arbitron's executives, he suggested that the company go even further in the direction of passive metering than Nielsen's People Meter. No button-pushing, in other words. Until then, companies had been trying to collect data about American television viewers by monitoring the set. "We need to monitor the person," Kolessar declared. Not long after, Arbitron pulled out of the television ratings business altogether.

One bitter, cold morning in January, Kolessar met me at the Arbitron offices, a four-story glass-paneled building in an undistinguished office park in Columbia, Md., not far from Baltimore Washington International Airport. Kolessar's lab is a small suite of rooms overflowing with computer parts and sound meters; he explained to me that it had taken

him far longer and more money than he expected -- 13 years and $80 million and counting -- to actually transform the idea for the P.P.M. into a physical thing. In part that's because the technology behind the P.P.M. has proved formidably difficult. In the course of his brainstorming in the early 1990's, Kolessar and his colleagues came to the conclusion that the best way to capture an individual's media exposure was to bury a unique, repeating, inaudible digital code in the audio tracks of every radio or television channel in the country; the P.P.M. would recognize that code.

So Kolessar began to work on psychoacoustic masking, which places a sinal just beneath the frequency of whatever is being transmitted. As Kolessar and his team worked through years of frustration, they discovered that the masked code's frequency could not be too low (where it would run into technical problems) or too high (where it would bother dogs and cats). Nor could it even modestly compromise the audio quality of a show or a song. "We used 'Achy Breaky Heart' for a while for our tests, but then I just couldn't take it anymore," Kolessar said. So he switched to "Don't Give Up," the Peter Gabriel and Kate Bush duet from Gabriel's album "So." The song is an intricate work of sonic architecture (of some 26 separate tracks, according to Kolessar), which made it a challenge for the engineers. Kolessar led me into Arbitron's sound studio to listen to what his team came up with after a decade. He cranked a recording of the Gabriel song through a pair of $20,000 speakers and switched back and forth between coded and uncoded versions. "You can't tell the difference," he said, more as a statement than a question. I agreed.

Arbitron has begun to ask radio and television stations around the country to run their broadcasts through a patented Arbitron encoding device; at the moment, almost all of the radio and television stations that a listener can tune into in the Houston metro area -- including over-the-air, cable and satellite TV (though not satellite radio) -- are coded for the P.P.M. trial. The stations are not being paid for this; instead, Arbitron has convinced them, through literal door-to-door salesmanship, that encoded broadcasts will enable Arbitron to measure their audiences better and thereby ultimately boost their advertising sales.

To Steve Morris, the C.E.O. of Arbitron, encoding is as much a matter of logic as economics. In Morris's view, code is now the only plausible way to follow a piece of content to see if -- and how -- it reaches an individual. "Media is following you not just when you consciously turn on your satellite radio in your car, or when you consciously flip open your cellphone and get some cable channel delivered to it," Morris told me. "It's also coming at you when you walk through Grand Central station. It's on the floor and on the walls. It's coming at you at the malls, where the L.E.D. screens are all around you along with the piped-in music. Advertising is becoming incredibly ubiquitous, so you need measurement that is equally ubiquitous." Can everything with sound be coded, I asked? "Yes," Morris said. Will everything with sound be coded? "Yes," he said.

In all likelihood, the Houston trial will show that people are exposed to far more media and advertising than they think, or remember. Some P.P.M. tests in Philadelphia have already indicated that wearers tune into twice as many radio stations on a typical day as they ever note in their diaries. For better or worse, the P.P.M. changes the definition of

"media consumer." On the downside, there is of course the question of whether people are actually listening to the stations or watching the television channels registered by their P.P.M.'s; Arbitron's P.P.M. will never be able to measure how intently a viewer concentrated on a televised Gap ad (but neither does Nielsen's People Meter). On the upside, the P.P.M. could reasonably establish that a person left the room during a commercial break, because the coded signal is interrupted when the device is out of earshot.

More significant, the P.P.M. expands the boundaries of media consumption. That's because it passively registers media both inside and outside of the home -- what P.P.M. volunteers are exposed to in bars, airports, health clubs and hotel rooms. This is something that has never been done, according to David Poltrack, the head of research at CBS. "Ten percent of viewing is now out of the home," Poltrack said. "And for teenagers and young adults it's often as high as 20 percent." For a financial news station like CNBC, which probably has a large bloc of unmeasured viewers watching at work during the day, the P.P.M. could produce a significant boost. "Nielsen does not measure offices," Alan Wurtzel, the head of research at NBC Universal, told me. "Nor do they measure vacation homes. They don't measure hotels. They don't measure hospitals."

And Arbitron plans for the P.P.M. to do more than establish new standards of measuring television and radio audiences. In Houston, for instance, the P.P.M. will register advertisements that run in theaters before movies; if Arbitron can persuade the entertainment industry to go along, the P.P.M. could also detect the use of everything from DVD's to video games to MP3 music files. (Arbitron has a special P.P.M. attachment to track headphone radio and iPods, though iTunes music and podcasts are not yet encoded.) In addition, Kolessar told me, his bosses recently asked him to experiment with adding Global Positioning System capability to the P.P.M. so that the company could determine when a person drives by a particular billboard or walks by a particular superstore on a given day. And he has been tinkering with radio frequency identification (RFID) so that a P.P.M. could track a reader's interaction with magazines and newspapers. A tiny chip embedded in a page like this one, perhaps the size of a pencil dot, would tell a P.P.M. that a reader picked up or opened the Times magazine. It might even register, with other P.P.M.'s, whether a majority of readers continued to the end of this article or stopped right here. "We've got all sorts of things we're playing with in preparation for a world that is probably a couple years away," Kolessar said. "But it's going to happen. And it's going to happen because the advertisers are pushing this. It's them. They want to know more."

The Counting Business

One of the most striking aspects of the P.P.M. has nothing to do with the technology: it's the fact that Arbitron and Nielsen are doing business together. If the P.P.M. proves to be good at quantifying the radio and television audiences in Houston this summer, Nielsen and Arbitron together could introduce the P.P.M. into various local markets across the country. In the view of the two former archrivals, Arbitron brings the P.P.M.'s patented technology to the table, and Nielsen brings its knowledge of the television industry and

its expertise in recruitment. A few years ago, Steve Morris, Arbitron's C.E.O., toyed with the idea of using the P.P.M. to challenge Nielsen, but he ultimately decided against it. "We looked at this and saw that there's a long history of people taking runs at the incumbent," Morris told me. "But there's no halfway here. If we were to go after Nielsen, it would be war, and at the end of the day there would be one person standing. And believe me, there are skeletons littering the trail."

How the P.P.M. fits into Nielsen's present television ratings system, or how it could change the way Nielsen conducts its business, is a hot topic of speculation in the industry. Over the past decade, Nielsen has maintained its monopoly even as the company itself has changed hands -- evolving from the homespun creation of Arthur C. Nielsen and his son, Arthur Jr., to a hugely profitable business that brings in revenues of close to $700 million a year for its parent company, the Dutch media conglomerate VNU. Nielsen clients -- networks and independent stations, and also a number of advertising agencies and advertisers -- pay the company substantial amounts for a steady stream of viewer data. NBC Universal and Viacom, for instance, probably each pay Nielsen around $50 million a year. In return for a long-term contract, Nielsen will customize viewer data to suit the needs of any client. What a media-buying agency, for example, wants to know about a particular program's audience may differ from what a station executive wants to know; the information national networks need isn't the same as what local stations need (to attract hometown advertising, for example).

In fact, while Nielsen ratings have a knack for anointing the winners and losers in our pop culture -- from Ruben and Clay on "American Idol" all the way back to Johnny Carson and Lucille Ball -- Nielsen's role as the arbiter of our cultural democracy happens to be a sideshow. The function of the company is to put a value on time itself, in terms of the commercials that use it. Nielsen's ratings are the single standard, the so-called currency, that allows its clients to characterize a program's audience (its size, age, sex and economic status) and then set a price. Some $60 billion worth of television advertising looks to Nielsen for guidance each year. The company's ratings are really just another way for people in the TV business to talk about money.

According to Nielsen, on a typical weeknight, somewhere between 103 million and 108 million Americans watch prime-time television. The average American household now sees 8 hours 1 minute of TV every day and has access to more than a hundred channels and several different sets -- often tuned to different channels in different rooms. Industry types call this phenomenon audience fragmentation. The days of a family gathering together on the couch are dying out for good. We're in pieces. Or as Steve Morris, the Arbitron C.E.O., put it more gently, "People are dividing." Every age group, every cultural group and every demographic group, Morris added, is in the process of getting media packaged expressly for its members.

In the next few years, this "personalization" will become only more and more pronounced. The television industry is in the process of updating its means of distribution by converting to digital signals, a changeover that presents new opportunities for networks to create multiple new lineups and channels (for example ABC, ABC HD, ABC

Family) to serve all the new fragments. Within a few years, you should be able to, if you can't already, satisfy any impulse, passion or modest enthusiasm through your television. Meanwhile, that typical Nielsen family that now has a hundred channels to choose from may soon have many hundreds more.

Whatever this transition means for TV viewers, it has different implications for advertisers. In recent months, in fact, a host of executives from big corporations, most notably Jim Stengel of Procter & Gamble, have begun publicly demanding that measurement companies like Nielsen and Arbitron provide better information about audiences. These advertisers don't mind talking to smaller groups of Americans. In fact, companies like fragments. The more specific an audience, the more confident they can be of reaching out to and persuading its constituents. Specifying like this makes it easier to justify advertising expenditures. "What we're looking for is not just ratings but the receptivity to the message," Beth Uyenco, the U.S. director of strategic research at OMD, one of the big media-buying agencies, said. To Uyenco, HGTV is an ideal place for home products, for instance, just as "Queer Eye for the Straight Guy" on Bravo offers a good place for grooming products. "Fragmentation can be a challenge," Uyenco added, "but if you have a very niche brand, it can be a blessing."

Yet to receive that blessing, an advertiser has to understand any fragment of television viewers -- understand it, that is, in all its mind-numbing, granular detail. Much like a poll that measures the popularity of presidential candidates, Nielsen currently uses representative samples of Americans (all ages, incomes, races, regions) to stand in for the enormous audience that watches television each night; it is almost certainly among the most sophisticated companies in the world at figuring out whom to contact for a reliable sample and getting those people to participate. For the moment, many Nielsen families in these samples use the company's set-top People Meter, which registers viewership regardless of whether a family has cable, satellite or rabbit ears on their television sets.

Nielsen has endured plenty of criticism during the past year over whether it works hard enough to include minorities among its People Meter families -- charges that are almost certainly unfair. The more legitimate concern is whether Nielsen's samples can measure a country, and a medium, that has become so fragmented. Nielsen's nightly group of national viewers is about 8,000 households; in about a year that will expand to about 10,000 households. In the local New York market, Nielsen's nightly viewers number about 800 households. Getting an accurate reading from these Nielsen families on a dominant program like the Super Bowl or the Academy Awards isn't so hard. It's those programs or channels where a slice, or a sliver, of Americans are tuning in. In other words, how do you draw meaningful conclusions if only a few Nielsen households watched Court TV or the Food Network or Telemundo late one night? What percentage were single African-American women older than 49? What percentage were young white men? What percentage were Hispanic teenage girls? The marketers -- the people who want to make sure they're reaching the right fragment with the right ad -- would love to know. But it's been getting hard to say. And as the number of channels grows, and the number of sets in every home increases, and the number of devices that can carry television signals multiplies, it's going to get even harder.

Where the Data Go

Late last year, the Nielsen company moved into a dazzling corporate campus 20 minutes northwest of Tampa in Oldsmar, Fla., a place that seems less like a town than a hasty arrangement of strip malls, office parks and juvenile palm trees set between the Tampa Bay Downs racetrack at one end of town and a dense patch of swampland on the other. The Nielsen Media Research Global Technology and Information Center, as it's called, is an impressive pile of glass next to the swamp. Nielsen spent $123 million in Oldsmar on three interconnected buildings, which is far less interesting than the way they constructed them: with redundant electrical circuitry, high security barriers and warning bells on top of warning bells. The point was to create a fortress so that no computer virus or sparking wire would compromise its ratings system. Ditto for any possible competitor. "This particular part of the campus is capable of withstanding winds of over 150 miles per hour," Alan Donnelly, who runs day-to-day operations in the main data building, told me in February as we walked through the computer room. "It's built to sustain a Category 5 hurricane." There were also fuel tanks and backup generators on the ground floor, Donnelly pointed out, that could power things for several days just in case. Donnelly took me through a security door and into the main control center.

It is a strange, and somewhat disorienting experience, to observe the Nielsen process at work -- to watch the people who watch America watching television. Nielsen still measures a large number of regional markets with written diaries. But the data from the 8,000-home national People Meter panel are tabulated in the Oldsmar control center, where a half-dozen employees face a 22-foot-wide screen that can tune in to any channel in the country at any time. The process is similar to what will happen soon with the P.P.M. in Houston, except the scale (and the implications) will be exponentially larger. At night, while Nielsen families around the country sleep, the data from the People Meters on their televisions are sent here automatically, over telephone lines, beginning at about 3 a.m. The technicians in Oldsmar collect the details about the shows the Nielsen families watched. They check it; they slice and dice it -- by demographics and geography and any criteria their clients would like. By late morning, they publish their list of the top shows for television executives in New York and L.A.

Fragmentation isn't Nielsen's only headache in all this. As its recent battles with Fox in New York show, putting new technology into old markets stirs up an industry that abhors any kind of volatility. "We're being simultaneously told to speed up the change to electronic measurement, and to slow down," Susan Whiting, Nielsen's C.E.O., told me. There's certainly some truth to this. And yet in the course of my interviewing nearly a dozen advertising and television executives, almost all of them faulted Nielsen for languor rather than aggression. Virtually every network and cable company I spoke with voiced frustration with Nielsen's tardiness in measuring "time-shifting" -- which happens when viewers rely on video-on-demand or TiVo-like devices (also known as digital video recorders, or DVR's) to "shift" the times at which they watch their chosen programs. If a Nielsen family watches "Dateline" from its DVR three days after its broadcast, in other words, those viewers aren't counted, and NBC gets no credit. Which may seem like a

minor thing, except 6.5 million Americans already have these devices, according to Forrester Research, and 17 million might have them by the end of next year. Nielsen has announced that it intends to track time-shifting starting next January, supplementing the People Meter with the Active/Passive Meter, which uses sound encoding much like what Arbitron uses for the P.P.M. (Each company has patented its own version.) Next year, prime-time shows will receive three national scores: "Dateline," say, would get a rating for viewers who watch it during its normal time slot, a second rating that includes viewers who see it later the same evening and a third rating of total viewers over the course of a week.

Nielsen is no slouch when it comes to technology. Its problem seems to come from implementing that technology in timely fashion. One advertising-side media executive, asking that I not name the firm because it frequently negotiates with Nielsen, put it this way: "They're very good at stifling innovation and managing the environment. They slow the pace of change down. And they're very good at making sure that their monopoly will continue." In this regard, some players in the television industry fear that Nielsen has agreed to support the P.P.M. only because it allows the company to slow down or squelch its acceptance. Susan Whiting told me that the issues are wholly technical, and that she won't be able to know whether Nielsen can proceed with a joint venture with Arbitron until the P.P.M.'s Houston test shows results that Nielsen feels comfortable with.

In the meantime, Nielsen continues to pursue other alternatives. One morning in Oldsmar, Bob Luff, the company's chief technology officer, led me through a tour of a different possible future for measurement, one with voice-recognition and face-recognition meters that the company is testing along with other devices. Luff then took me into his engineering department, a matrix of cubicles where a small army of Nielsen technicians take apart the newest televisions on the market, so that the company understands the circuitry well enough to attach a People Meter in the event that a prospective Nielsen family has a new model in its house. The Nielsen offices in Florida actually have storerooms full of brand new TV's and DVR's and video-game consoles for no other purpose than research and deconstruction. Luff and I paused by a desk where one of his engineers had pulled the bowels out of a huge new flat-screen television. "He'll reverse-engineer this," Luff explained to me, "and he'll figure out where we can connect. He might also take close-up digital photographs for the field technician to use on his laptop." Nielsen, Luff added, has blueprints and plans of some 10,000 televisions on file.

You have to wonder if this is a losing battle -- whether keeping up with the technology curve has perhaps left Nielsen with little time or inclination to get ahead of it. There is, moreover, an aroma of sweaty exertion to the Nielsen process. And that comes not just from the ripping apart of new televisions. The company also puts prodigious efforts, and tens of millions of dollars a year, into maintaining its representative sample of Americans. Hundreds of field reps knock on hundreds of doors every month to invite them into the Nielsen sample. Then those same reps monitor the volunteer households, which entails maintaining intimate, day-to-day oversight, often for several years, to ensure each Nielsen family complies with its rules and pushes the correct buttons on the People Meters.

Whether this can continue depends, in large part, on economics. The more America fragments, the bigger the sample you need to represent the country. And the bigger the sample you need to represent America, the harder and more expensive it is to maintain in a door-to-door, labor-intensive manner like this. "I wouldn't predict that Nielsen is going out of business," said Richard Fielding, the head of research at Starcom Media Worldwide, one of the big media buying agencies. "But they are at a crossroads. And it's almost as if their business model is evaporating overnight."

You Are What Your Cable Box Says You Are

At some moments, trying to discern the business of companies like Nielsen and Arbitron gives way to the question of whether America is becoming weightless, an agglomeration of data about who we are and how we behave that seems to have more substance (and certainly more financial value) than our actual selves. It was hard to avoid this thought early one evening last winter as I drove over the Sunshine Skyway Bridge over Tampa Bay toward Bradenton, about 60 miles south of Nielsen's Global Technology Center, on my way to ErinMedia. Several years ago, a few computer geeks and new-economy types started this company in pursuit of something no measurement company has yet pulled off: tapping into cable set-top data to get a complete picture -- not a sample -- of what viewers in a particular city or region are tuned in to at any second of any day.

Though known to media planners and many broadcast and cable executives, ErinMedia does not seek attention; in a business sense, it's pretty much off the grid. When I turned into its nearly vacant parking lot, fronting a mostly empty office building set amid empty fields and dark stretches of forest along Route 301, the company seemed to exist not only on the edge of Bradenton, but on the very edge of reality. ErinMedia has no People Meters, no P.P.M.'s, no gadgets, no embedded codes. A few dozen employees, a couple of computer servers and a number of patents pending in Washington, that's all. The business is less a conventional company than a pure expression of mathematics.

Digital cable set-top boxes are already connected to sets in the homes of 25 million Americans (a number expected to nearly double by 2010). When you get your television signal through one, you receive programs, or "downstream" data, from your cable company. But the cable companies can also get a transmission back from you; they can find out what you watch. And they can also find out when you watch it. Federal privacy laws and various technological challenges (especially with older, analog set-top boxes) have made the cable companies reluctant to use that information so far. But some third parties have tried to come in and calculate, through some very complicated software applications, whether viewer information can be tabulated while still protecting privacy. "We figured out how to get the data and how to figure it out demographically without knowing who you are," Frank Foster, the president of ErinMedia, said as we sat down in a conference room in the company's office building. Foster maintained that his company can offer its clients -- cable operators, television stations and media buyers -- a detailed breakdown of a regional television audience at any given time. If a city's digital cable company allows ErinMedia access to its data, in other words, ErinMedia could deconstruct the audience for any show, Foster said. He could tell a producer that 44,312

sets were tuned to the first 4 minutes 7 seconds of the local news. Or that 11,812 cable households surfed channels during the commercial break in the N.C.A.A. semifinals. He could track the viewers as they tuned in and out and precisely where they came from and where they turned to. A few weeks after 9/11, ErinMedia tested some data from Comcast to see what its television audience did that day and in the weeks afterward, compared with viewing patterns in the weeks before. The company charted precisely how many households tuned in and when. It found out what caught viewers' eyes.

Foster was sitting across the table from Frank Maggio, the company chairman. When Maggio chimed in, he pointed out that a second-by-second census of actual viewers might even do more than what Foster described. It could tell the producer of a local news show that the audience preferred the sportscaster on a competing channel -- and ErinMedia could prove it by showing how many viewers switched channels at the relevant time. Perhaps most important, ErinMedia could use set-top data to register small numbers. The chief of a future microchannel, in other words, could tell advertisers exactly who is in its tiny but enthusiastic audience. If only 300 households tuned in out of 300,000, they would still be counted. And if an advertiser suddenly wanted to show an ad for Wolf stoves or Volkswagen Passats specifically tailored to those 300 homes (and be assured, that day is coming soon), it would be able to. ErinMedia, both men said, could give a programmer or cable company a detailed picture of an audience within 24 hours.

Maggio, a young entrepreneur, says he firmly believes that Nielsen is the relic of a simpler time, an era of three networks and a less diverse America. He ascribes no bad intentions to the company. But he relishes the potential for an outfit like ErinMedia to destroy it. "I believe I could go into Nielsen and quadruple their profits," he told me. "It's so much more efficient to use our technology." Then Maggio said he was willing to keep his company going as long as necessary with millions of dollars from his real-estate projects. "We can pick up where Nielsen leaves off, but we can do more than that," he said -- the implication being that ErinMedia could not only give cable operators, stations and advertisers detailed insights into their audience, but even, under the right circumstances, also help establish a new ratings currency in place of Nielsen's old one. To many people in the industry, this would seem preposterous. But Maggio had a counter: "I'm kind of brash," he said. After a short pause, he shrugged. "Actually, I'm a maverick."

To be sure, Nielsen has already seen the light on set-top data, even as it publicly defends the aging technology of its People Meters and the methodology of its samples. In fact, both Nielsen and Nielsen's biggest global competitor, a European company called TNS, have been in discussions for some time with various U.S. cable operators about using set-top information. It may eventually come down to what the cable operators decide is in their best interests. They're the ones with the data -- our data -- which is tantamount to saying that they're the ones sitting over the diamond mine. "It's a fairly simple process to take set-top boxes and capture anonymous viewing information," Steve Burke, the chief operating officer of Comcast, the country's largest cable system, told me. "But it's not what we do. If you're a cable company, you don't get up in the morning and think: how can I create a competitor to Nielsen? You get up and think: we'd like to get V.O.D.-rated

and grow our business and wonder when Nielsen is going to hurry up and get off the dime." Nevertheless, Burke admitted, it wouldn't take much at this point for those on the cable side to force a drastic change. "The obvious consortium would be you get some cable companies, a satellite company and a couple big advertisers together to start a Nielsen competitor," Burke mused. I asked him if they were near to doing that yet. He let out a frustrated laugh. "We're getting closer," he replied.

Whether a cable consortium ends up choosing a partner like ErinMedia, or whether cable companies get together and then choose an established partner like Nielsen, probably matters less than the net effect of changing the way viewers get counted. When the music industry's charts switched from surveys to actual sales data in 1991, they shook up longstanding assumptions (country and rap were more popular than realized, for example). And to be sure, a change like that can't happen overnight: any new way of counting, put suddenly into effect, would wreak havoc on TV-industry finances by elevating the value of air time on some shows and deflating others, thus forcing stations and networks to offer advertisers "make good" ads when audience sizes don't meet their expectations. (When Nielsen introduced People Meters in the New York region, for instance, the size of the audience for "The Simpsons," on Fox, turned out to be 30 percent smaller, while Comedy Central's audience increased by 225 percent.) Frank Maggio at ErinMedia makes a persuasive case that the set-top data is bound to come into play sooner or later, even if it turns things upside down in the process. "What America is paying for advertising now," Maggio said, "is based upon people who are going to come into your house and take apart your TV."

As Maggio see it, ratings have to come as close to the full truth as technology allows, and the fact that Nielsen uses samples to represent him is, he said, "infuriating." Of course, such fury happens to suit his company's best interests; Maggio clearly seemed to understand that in making his point, he had located Nielsen's sore spot. "It's the American way," he said, comparing the use of set-top data with Nielsen's methods. "We only accept elections that represent all our votes. Why is this different? We don't have to do it Nielsen's way anymore. And we really shouldn't do it that way anymore."

All About the Advertising

In the view of television executives like David Poltrack, the head of research at CBS, there is no one-size-fits-all way to get true ratings. The P.P.M., for instance, is portable enough to capture any television that can be heard in an increasingly portable world -- but it still relies on a representative sample of Americans to wear it. And while set-top data can give nearly complete insights into what a vast number of household televisions are tuned to, it cannot capture media outside the home or even data from households that lack set-top boxes, and it cannot yet register whether it's the grandmother or the young mom (or both) in front of the television. "I believe that the P.P.M. is a part of the measurement system of the future," Poltrack told me one day in his office at CBS, "but it isn't necessarily the entire measurement system of the future. I can envision a system where you've got one database of hundreds of thousands or even millions of homes with set-top boxes feeding information into a measurement system. You also have these people

carrying P.P.M.'s, feeding information into that measurement system. And you may have a traditional Nielsen household sample feeding information, too." As Poltrack sees it, the end result would be a ratings system that comes razor close to reflecting what the country now actually watches. It would also, in effect, be a mass cultural election, every day and night.

I discovered that Poltrack's vision seems to be a fairly popular one in the industry, regardless of which side you're on -- advertising, programming or measurement. "I go to bed at night feeling very good," said David Verklin, the C.E.O. of Carat Americas, one of the biggest media-buying agencies. "I feel the world is coming our way. The world of digital television, the P.P.M., the set-top boxes will give us the data we want."

The worlds that executives like Poltrack and Verklin ultimately want, however, are quite divergent. Both desire better ratings. But Verklin wants them for more than just television. His clients, the companies that pay for ads, want to know everything about how we use every medium. They don't think of television as the future. Programs are the future. Joseph Turow, a professor at the Annenberg School at the University of Pennsylvania who's probably the reigning academic expert on media fragmentation, takes a similar view. "Television has to be thought of not as a box anymore but as a social role, and I think that advertisers have begun to see it that way," he explained. Turow said he now sees little difference between television and the Internet. Nor do his students at Penn. They watch "The O.C." wherever and whenever -- on their laptops, at home on TiVo and by swapping the show (perhaps illegally) through a Web-based file-sharing program called BitTorrent. The coming generation is accustomed to the idea of watching or listening to anything on any device that's nearby, Turow said. In the meantime, his generation (he's in his 50's) "still thinks of media in these compartmentalized ways."

The P.P.M., of course, ignores those compartments. The endless tinkering at Arbitron is creating something to measure any piece of media, whatever form it takes. That's what Carat's Verklin wants. But that's not all he wants. People in Verklin's camp don't necessarily spend their days worrying about who is watching what. They worry about who is watching their clients' commercials, especially now that fast-forwarding or clicking past them is so easy. So for Verklin, the evolution in measurement can't stop with improved ratings. The next step, and the more lofty ambition, is to measure advertising's impact.

There is a dream within the counting industry that has been around for decades, called single-source measurement, but it has never been successfully realized. Recently, thanks to the P.P.M., this goal has been resurrected under the name Project Apollo, which is a joint effort between Arbitron and VNU (Nielsen's parent company). "Apollo is basically something that's been the holy grail of measurement since people were drawing woolly mammoths on the side of caves," David Verklin said. It's a closed-loop system that will measure the media people absorb -- and then what they buy.

To this end, Apollo will track 70,000 people across the country who wear the P.P.M. all day. But not for the sake of ratings. The advertisements and messages these 70,000

people see, hear, read, encounter will be matched to the purchases they make. You could say it's a massive scientific trial of cause (marketing) and effect (buying). Or you could say with some trepidation that it's about creating a more perfect, more efficient consumer society. Linda Dupree, who is in charge of Apollo at Arbitron, put it to me this way: "For those who have worked in advertising a long time, we think advertising works, we just don't know how." Apollo (the name came from someone in the project enamored of the history of early NASA launchings) should settle that.

At the moment, representatives of Arbitron and VNU are making presentations around the country to encourage big companies to sign up for the service, which should be available sometime next year. The price is high (up to $1 million per company), and many businesses are reluctant to invest in an untested product. So Arbitron and VNU are trying to stress the practical appeal: Apollo should allow companies to understand which advertisements get consumers to buy their products, but could also offer insights into the connection between their tactical approach to advertising and the urge to buy. Moreover, Apollo could give advertisers a clearer understanding of whether radio, TV or even the Web (the Internet usage of those 70,000 people will be monitored) gives them the best rate of return on their ad dollars. For instance, if Apollo demonstrates that advertisements for lemonade have a higher success rate on radio than television -- that is, the radio advertisements seem more successful at getting Apollo volunteers to buy the lemonade -- it would help companies figure out how to reallocate their marketing dollars.

So far, only Procter & Gamble has made a public commitment. But many people in the measurement industry told me they regard the ultimate success of Apollo, or some variation of Apollo, as inevitable. "What we're talking about with using the P.P.M. for ratings is a significant change, along a fairly predictable continuum, going back 10 or 20 years," Steve Morris, Arbitron's C.E.O., told me. "You want to talk about something that's discontinuous? Apollo is discontinuous. That will change the way people think about how we buy. Not right away. It will take time. But I believe that it will."

Since Morris's company would benefit from the success of Apollo, with the P.P.M. as an essential element in the project, he has good reason to talk up its potential. Still, Morris, a soft-spoken and studious man, is hardly the sweet-talking salesman, and I found his logic airtight. "Discontinuous, disruptive things do come along," Morris said, "and you don't have a choice whether you follow them or not. They're driven by need. I think if you talk to advertisers, Apollo is exactly what they want. And the advertiser is the top of our food chain. So if that's something they want, and the technology will allow us to produce it, then you have to assume that's going to be a big part of the future."

What Morris couldn't say -- indeed, what all of the advertisers, measurers and programmers couldn't say -- is what this means for the other parts of the food chain. Marketers often make the point that the consumer is king; one consultant for Procter & Gamble told me that that company's chairman, A.G. Lafley, never hesitates to say that the consumer, and only the consumer, is in charge. Apollo and all the other measurement services might give credence to that contention: corporations that are serious about selling products to a fragmented nation barraged by media messages will come to us for a

deeper kind of understanding and approval. You could, however, see Apollo, along with the P.P.M. and encoded signals and set-top data, as a stealthy realignment in the marketplace.

What we did in the evenings, what we bought, what we desired -- wasn't that always a riddle to be guessed at by advertisers and programmers? The window-shopper, the TV watcher, the radio listener, the Web surfer -- we were all so unpredictable, so capricious and terribly human. We were king because we were somehow mysterious. Who will wear the crown now?