ELECTRONIC NEW MEDIA AND THE AUTO INDUSTRY:

NEW DIMENSIONS IN "MARKET FACING" SYSTEMS

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PREFACE

This manuscript was prepared in late 1995 as the result of several related research streams. First, the author was conducting field research on automotive distribution and retailing with in his role as Associate Director of both the International Motor Vehicle Program (IMVP) at the Massachusetts Institute of Technology and the International Car Distribution Program (ICDP), an independent non-profit research consortium studying distribution worldwide. Second, the author has been conducting independent field research into companies developing what are commonly called "new media" technologies.

In 1994, these streams began to converge in ways almost unimaginable several years earlier. This article is an early attempt to illustrate some of the patterns and trends emerging in three major industry sectors: automotive, information technologies, and advertising/broadcasting. These industries have always been related, but the author began to notice completely new approaches in all three areas appearing at field sites --- approaches that began to change age-old relationships, and pointed to completely new ways of doing business.

Some of the material in this article is already dated. People only half-joking talk about "internet years" being four weeks long --- so fast is the current rate of change in the topics treated in this paper.

Having said that, the core logic of the article remains solid in later 1996, and is increasingly supported by the actions of businesses who are now investing heavily in the fledgling new media systems discussed in this article.

The manuscript is being released in its current form to help discussion in the ongoing research process. The point of this paper is to stimulate further discussion, not to make sweeping predictions of the future. All comments are welcome.

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EXECUTIVE SUMMARY

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Revolutions often start well before the first shots are fired.

Deep social trends develop over time, waiting for some precipitating event, a new set of leaders, or a technology that allows organizations to behave differently. The precipitating event usually catches our attention, or seems surprising --- but the direction of the revolution is typically evident well beforehand.

This manuscript is about converging trends in three major industries — autos, information technologies, and "media" (including advertising and the broader media) — trends that almost certainly presage a revolution in "market facing " systems that link these industries to their markets, and to each other.

Each industry has created revolutions in the past, and has demonstrated the "early warning" phenomenon.

- The first "auto-mobiles" were invented about a century before the Ford and Daimlers commonly thought to be the early prototypes of today's cars. Early "steam engines on oxcarts" really started the revolution that seemed to take off with the Ford assembly line decades later.

- "Computers" were invented decades ago. And while they were "revolutionary" in the 1940's and 1950's, those developments were merely early hints at the significant upheaval we now experience in computation and communications industries.

- The broadcast industries, seeded in the last half of the 1800's through telegraphy and telephony, have revolutionized the way the modern world communicates, develops culture, and conducts commerce. Advertising bonds the media industry to the broadcast media industries.

While it is impossible to predict the future, it is possible --- when one steps back from the daily battle for the bottom line --- to reflect on social trends that are waiting for precipitating events. Then, when precipitating events really do happen, it is easier to understand at least the basic directions the revolution will take.

As of the mid-1990's we see merging trends in three major industries:

- Internet-style communications and related technologies are developing at an unheard of pace in the electronics and communications industry.

- Simultaneously, the advertising and "broadcast" media (TV, Radio, Print, Etc.) are undergoing fundamental shifts in how they operate.

- And, the auto industry, owing to a thirty-year progression in global competition is seeking major changes in its distribution, retailing, and service end of the business...to match the revolution that has already taken place in manufacturing.

These three trends are coalescing because:

- The "internet-style" technology is not only forcing changes in the electronics business, but is the fundamental driver of change in the advertising and broadcast media businesses.

- The "internet-style" technologies are allowing major changes in the way cars are distributed, sold, and serviced.

- The automobile business is one of the major financial pillars of the advertising and "broadcast" media industries.

- The advertising and media industries are a major player in the selling and distributing of cars.

In short, three industries at the root of modern society, find themselves locked together -- still mysteriously -- in a strategic revolution, with thousands of jobs ands hundreds of billions of dollars of commerce at stake.

But this is not all. The merging industrial trends are linked to deeper social trends.

- A generational demographic shift favoring visual media

- A desire to use new communication forms that may imitate similar periods after the invention of the printing press, telegraph, and other technologies.

- A shift in media consumption away from the standard broadcast/print mix of the past several decades

- And -- seemingly related only to autos, but fundamentally related to all industries -- the decades-old consumer frustration with car retailing and distribution.

Because all these forces are converging across several industries, we can be fairly certain we are in the early stages of an industrial-consumer revolution.

Even though this story is about autos, we should not think the revolution stops here. Just as the American revolution had indirect effects on the one in France, the auto revolution is intricately and subtly tied to a larger industrial process. Because many of these trends are being played out most rapidly in the car business, with some of the largest dollar results — it is instructive to look to the auto changes to gain insight into the revolution as it rolls out in other industries.

This paper is an exploratory strategy piece, based upon field research, that makes several fundamental points:

- New electronically based technologies *allow customers to demand things they have never been able to demand before* (easier ways to shop, for example).

- Since auto customers are a huge population and have been looking for better ways to shop for cars for years, they are latching on to the new technologies. *even though these technologies are hard to use* --- a predictor of future demand.

- The auto industry is a fertile field for new industrial applications of "internet-style" technologies, because it is a massive *"latent system waiting to be wired together"*. It has existing information systems spread throughout its trillion dollar sector --- all of which can benefit from new forms of communicating with each other.

- In all industries, but especially in autos, there is a crying *need to connect the "market-facing" parts of the business (marketing, advertising, market research) to the "heavy metal" manufacturing parts of the business.*

- Because the new technologies will allow the existing "latent system" to connect as an actual system, and because so many people will save or make so much money by doing so, the auto industry will move relentlessly to connect the "market-facing" systems to the design and manufacturing systems.

- Because today the advertising and media industries are heavily dependent members of the "market-facing" part of the auto industry, as the consumer driven demand to hook up the latent system rolls out through the industry, advertising and media companies will be swept along in the revolution. If they are to remain viable, they will have to adopt new strategic postures.

- All of these revolutionary moves will be backed up with strong economic incentives:

  - Car buyers want *cheaper cars* and will shift buying to *better channels*

  - The returns on investment in the car business depend on getting *major capital productivity gains in distribution and retail*

  - The advertising and media companies cannot afford to *lose the billions of dollars* they get from car distribution and retailing.

  - New *external investors* in car retailing and distribution will demand still tighter performance, reinforcing the drive toward efficiency that can best be served by electronic technologies.

In short, the three major industries will be forced to see life in a very different way --- together . And they will come up with often radical new ways to do business --- as they have done several times during the century.

This article is aimed not just at the car industry, but also at members of the related communications and media industries. It is not meant to be a prescription for the future, but rather an open reflection on a number of trends observed in extensive field research. The bottom line of this manuscript is that *no position is right or wrong, but that it is possible to see the basic directions this revolution will take.* Given that, we should not be afraid to experiment with new industrial - consumer formats......and there is a lot to lose if we don't.

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A REVOLUTION BREWS

Car companies and retailers are facing changes in buying behavior prompted by new forms of electronic media. Rapid expansion in on-line services and the explosive use of the internet have brought a new form of consumer to the auto market in North America: savvy customers armed to the teeth with information from traditional sources, and from emerging sources resident in the electronic world.

But new media are not just about new ways to get information. New media driven systems preview alternative ways to select, find, and buy vehicles, linked to, but moving beyond the traditional car showroom. Customers are gaining much more control over the buying process, and they can make decisions much more quickly if they know how to use the new tools at their disposal. And they will learn how to use these tools. Car buying is one of the great social pastimes of modern culture, so savvy customers will quickly train others through world-of-mouth and the vast cultural dialogue that surrounds the car buying process.

Furthermore, in an entrepreneurial North American auto market, free-wheeling, well-moneyed players are responding to these new customers by creating entirely new retail and distribution channels for the first time in decades. And, because the distribution front end of the auto system really paces the entire manufacturing and design system, the front end changes that now appear as novelties on some home computers, will most likely reorganize the basic structure of the entire auto system, possibly **faster than we think**.

Also, because the advertising and media industries are so heavily dependent upon the "front end" of the auto business, the auto revolution is bound to re-shape fundamentals of the "marketing and entertainment" industries as well. Interlinked finances and technologies will spur completely new consumer products and services.

If this scenario seems too radical, think back a short fifteen years ago. Then, none of us had PC's. AT&T controlled the phone system from top to bottom. IBM owned the world's basic computer architecture and virtually printed money. Most automakers doubted that Japan could have a huge $1500 per car cost advantage. "Just-in-time" was a phrase uttered by very few manufacturers. Cellular phones barely existed. Faxes were expensive corporate tools. Cable TV was still a new business. CD-ROMS and video games were dreams. We thought oil would soon run out. If you told Wall Street types that IPO's of Microsoft and later Netscape would yield hundreds of millions or billions of dollars of capital value in a day, they would have looked at you strangely.

Skeptics who bet against these trends would have been ignoring the almost biological integration of new technologies into the human social system. Betting on change is risky, but betting against basic social movements is folly.

THE STORY STARTS WITH MARKETING AND DISTRIBUTION

World-wide, the distribution and retailing front end of the auto industry system generates around $500 billion dollars of economic activity each year (that's half a trillion dollars), and this economic engine influences the remaining trillion dollars generated in the manufacturing chain. This value is based upon social behavior, not upon corporate mandates, and because the emerging new media and technologies we see today are rapidly integrating into social life, we can expect the social changes to re-route large portions of this 1.5 trillion dollar economic being.

As of mid-1995, the new customers and new buying methods represent only fledgling trends, unseen by many, ignored by some, and seized at the moment by only the most prescient customers and entrepreneurs (or intrapreneurs at the massive car companies).

For two years, through the International Motor Vehicle Program (IMVP) at MIT

and its research partner, the European-based International Car Distribution Program (ICDP) we have been studying both the new "on-line" world and its relationship to the vast field network of automotive distribution, retailing, and manufacturing.

Our field research shows that the "new media" trends now underway are not only rapidly growing and evolving, they are based upon long pent-up consumer desires for better ways to buy and use automobiles. By quirk of history, these new media trends also coincide with strategic auto industry moves to streamline the last remaining vestige of the "pre-global" auto business: the traditional relationship between makers, sellers, and buyers of cars that hasn't really changed much for decades. Just as car design moved from the era of tail fins to much more complex product technology, and manufacturing moved from "just-in-case" high inventory manufacturing methods to "just-in-time" lean manufacturing, automotive distribution and retailing are being transformed from a "push the metal" model to a still-undefined "customer pull" streamlined system.

However, because these emerging media-driven trends are based upon deeply rooted economic factors long at play in the auto business, and because they serve customers well ,they presage structural changes in the market that are as inevitable as was the Japanese rise to power in the late 1970's and early 1980's.

In addition, because the new market trends will complement manufacturing trends, those companies who take advantage of market changes to link their marketing with manufacturing will find themselves with powerful new systems of competition that link factories and customers in new ways. Followers will be hard pressed to catch up, just as they were in the global manufacturing revolution that started more than 15 years ago.

"The internet" and other forms of new media do not simply represent some new toy for customers to play with, or some new way to "advertise". They present

the means, *in combination with innovative distribution systems*, for the entire market structure of the automotive world to shift once again, re-sorting the various competitors.

Since we are trying to connect a strategic logic to detailed operating innovations observed at ground level, we need to explore two crucial strategic background environments before examining the details we see in field research. First, we need to look at the media environment, which is the primary reflection of broad social change. Then we need to look at a bit of auto history to show how this kind of social change has effected the industry before.

THE FIRST ENABLER: WHAT ARE "NEW MEDIA?"

In mid-1995 we were seeing a host of new "convergent" technologies, each well publicized. In simple terms, we are looking at advances in:

- Proprietary on-line services (America On Line, CompuServe, Prodigy, Delphi, and others),
- CD-ROM and related technologies (high density easily distributed information),
- the "internet" (and a whole industry of rapidly exploding services),
- "interactive" cable TV (many varieties),
- computer-based networks (local, wide area, and galactic),
- derivatives of traditional telephony networks (voice mail, video conferencing)
- new uses for old networks (long distance services and private networks become instant "open systems" for products well beyond telephone calls), and
- growth in software that astounds even the wunderkinder who write the miraculous new code ("middleware", "biological" style operating systems, clients and servers, intelligent agents, etc.).

Each of these categories contain *miracles only a modern day Jules Verne could have seen ten years ago, but the real magic for the auto business is in the combinations these new technologies allow and in the strategic pattern of these new media.

STRATEGIC INDUSTRY ORGANIZATION

Perhaps easiest to grasp is the strategic pattern of the new technologies. **Figure 1** represents a strategy map of the main technologies, arrayed according to two simple axes.

The horizontal axis represents the degree of customer control over his/her use of the medium: Technologies on the right offer the least amount of user control, technologies on the left offer the highest degree of user control over the medium.

On the right (least user control) are traditional broadcast TV and radio. A

Figure 1: New Media Strategic Map
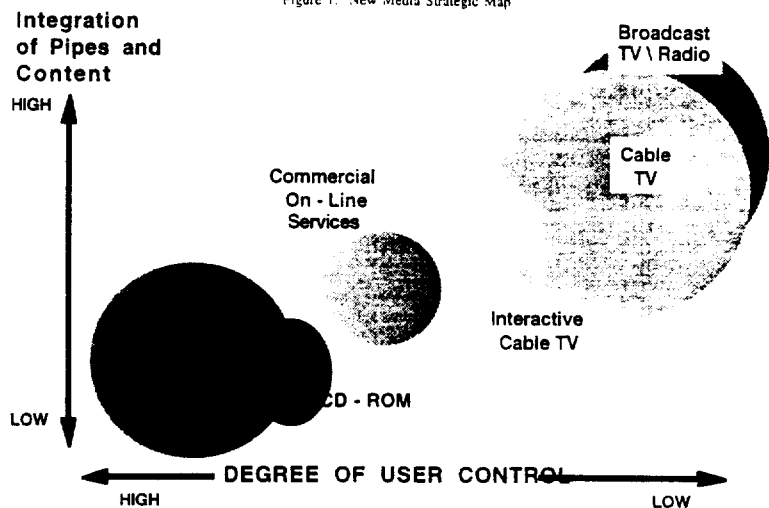
viewer can only exercise remote, slow acting control over network broadcast TV, by switching channels or by complaining long enough about program content that it shows up in network executives data reports. On the left (most user control) are stand alone CD-ROM (user can choose when, how , and what to access in vast content stores), and "the internet" which offers users a degree of selection and control perhaps previously unknown in any media form.

The vertical axis represents a different characteristic: the degree of separation between the content of the media and the "pipes" that bring the content from the content provider to the user. The top of the axis represents a tight bonding of "content provider" and "pipe owner". (The organization that creates the program or movie is also the organization that controls the way the program is shown to the customer.) The bottom of the axis represents media in which there is a very loose connection, or no connection between the content provider and pipe owner. (The organization that creates the program transmits it over a distribution means that is controlled by someone else.)

Notice the pattern. Broadcast TV is in the upper right area of the map, because there is very little user control over the medium and because the content provider and pipe owner are for all practical purposes the same. Those who choose what content to create and show--- the broadcast networks (NBC, ABC, CBS)--- are virtually the same as those who provide the "pipe" that conveys the content--- the network feed and affiliate structure. In truth this relationship is not so simple, because there are complex means to generate TV network content and transmit it, but in comparison to the other technologies/media on the map, the owners of content and pipe are the same.

Witness "the internet" on the other end of the map. Content on the internet is virtually unregulated; anyone can post almost anything. In fact *the user can simultaneously be viewer and a content generator* by creating a "home page". The "pipes" on the internet are really a "biomass" of loose connections, owned by no-one, controlled by no-one. So, in comparison to the rest of the technologies/media on the map, the internet offers almost unlimited user power to select content and almost complete dissociation between content providers and pipe owners.[1]

In the middle are the "proprietary networks". They offer users much more control over content selection than broadcast TV and radio, but because they do limit the content they offer and do offer their services over limited proprietary systems ("pipes"), they don't offer the complete freedom of the "internet like" technologies.

Where is all the customer driven growth on our map?......in the least constrained sectors of the map. Broadcast TV is quite mature, but "internet like" services are booming.[2] If someone had set up an index fund based solely on user growth in the internet, its investors could have paid most of the national debt. Why? Because this unrestricted form of social interaction is highly desirable, and fits deeply within the social fabric of the United States. It even fits within the more socially engineered political cultures of the world in Europe and Asia.[3] This sector of the strategic media map is being driven by participation from all cultures of the human species, no matter where in the world they live.

This, not so by-the-way, is the true strategic power of "interactivity". It's not just that users can see more movies on a convenient schedule. It's that no single organization, even the largest governments or corporations, can easily set the boundaries of what customers (or "citizens") can do in the left-hand sectors of the map. It's not two-way interactivity. It's multi-way interactivity without

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[1] An attribute of the internet is that it represents the opportunity for each user to create his/her own "channels". The user uses a browser (or newsreader, FTP application, or other access software) as a window on the vast net, and collects a series of interesting content sites ("hot list") or linkages that can regularly bring the user whatever content he/she chooses. Contrast this to the pre-packaged network TV "channels" where the user is locked into a single pipe (the network affiliate station) and content chosen only by industry executives. Browsers like Netscape are really becoming "channel making tool kits" that enable individual end users to become their own network executives. The end user can also become a "content producer" by allowing his/her content to be accessed by millions of other users. This is the new network paradigm that makes the new media revolution so revolutionary.

[2] One has to carefully define measures of new media size and usage, but most estimates suggest internet use has tripled during the 1994-mid 95 period. Recent surveys suggest tens of millions of people use new media in some regular way. The initial public offering of Netscape has joined Wall Street record books.

[3] One might argue that the new media will be even more novel in these political economies because it will offer market freedoms almost instantly beyond the reach of regulators and social market engineers.

predictable boundaries. [4] People can freely rearrange pipes and content to meet even subtle changes in market cultures and behavior.

The specific "strategic location" of this new media growth is intuitively clear to millions of customers, with meaning for most modern industries, and special meaning for the automotive industry.

DYNAMIC TECHNOLOGY COMBINATIONS

The second dimension of this new media phenomenon, the combination of new technologies, is less easy to define, because it is happening faster than even well-equipped industry analysts can follow (there have been at least two generations of new internet software during the rather short gestation period of this article).

Despite the difficulty of forecasting specific trends, the strategic meaning of technology combinations is straightforward. While the hot growth areas of new media are in the "lower left" sectors of our map, mastery of the new technologies requires attention to all sectors, old and new, because they are combining in ways that bridge "traditional" customers and "techies" by offering extraordinary ease-of-use to non-technical individuals.

Recently we have seen some of the largest "old" network owners---long distance telephony carriers--- re-define the strategic nature of their assets. We have seen AT&T re-conceive of its telephone network from a set of pipes to carry phone calls, to an "environment" that can link almost any of the media displayed on our strategic map. We have also seen the internet become a long distance phone carrier,

enabled by a new software application that bends the intended technology of "the net" to a use possibly never conceived by its pioneers: you can talk to friends over the internet, without dialing a telephone number or entering the billing systems of telephony companies. Old meets new in unique combinations. [5]

We are seeing changes in CD-ROM capabilities (actually an "older" technology) to allow links between ten-year-old on-line services and CD's resident on home computers. A user can get blended information from disc storage and remote dial-up computers simultaneously, allowing high volumes of content stored on disc to be activated by the sparse commands coming over "thin" phone lines. A user can order software by having the programs stored on a CD-ROM activated by a "key" command that comes over the phone line. Another user can play a visually-rich video game in real time with other players located throughout the world; the video is stored on each user's CD, the game moves are simple commands transmitted over the phone connection between players. Still another user can browse a catalogue stored on CD, and get updated pricing, or a coupon for a local retailer through simple commands over the phone line from the distributor or manufacturer. Two years ago, people were wondering how they could get large amounts of video or music content over limited old phone lines; now the combination of technologies allows content to flow despite the technical limitations of one medium or the other. "Ordinary" non-technical users who had mastered the simple act of playing a CD-ROM, can participate in a "high tech" system without mastering communications electronics.

As we write, companies are beginning to connect "thin" phone lines to "thick" cable TV lines in new set-top boxes that bring the telephone line across the living

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[4] As an interesting mental exercise, try to envision how value-added taxes will be collected on global internet-derived product sales. Or, think about how consumers in protected markets will feel when they can see prices posted in on-line shopping malls that are 40% lower than prices they see in their stores. Right now users in protected markets can get new software from free market sources simply by downloading it over global networks. "Magazines" posted in one nation can be viewed by readers in any nation served by even rudimentary phone service.

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[5] At the time of writing, new software allows "listeners" from around the world to access radio stations that have a broadcast license for a much narrower geographic area. Emerging compression techniques will allow similar video transmission in not too many years (months?)

room to your color TV...the American "electronic fireplace". At the moment the resulting combination allows only limited services ---you can do some telephone banking while the cable company is broadcasting commercials. But shortly entrepreneurs will launch technology that will combine these two very powerful media ---cable TV and telephone--- in ways that neither industry envisioned a while ago. The interactive game providers are already in business on this one. Home shopping organizations will move into this combination with ease....and, the same customers who buy dresses and exercise machines over cable TV and 800 numbers are the ones looking at the leasing brochures provided by car companies.

"Massification" is happening quickly: the basic "engines" that bring these technologies together, personal computers and other "smart boxes", are becoming widely distributed to more homes and offices every day. When our auto field research started almost three years ago, we saw little evidence of the new media in our showroom visits. Now, when we interview dealers, we frequently hear stories from salespeople about "average" customers whose kids got them reams of on-line auto buying information before they visited the showroom. We have seen dealers who in the last 12 months have created back room "networks" from simple $4000 PC's to link up with "wired" potential customers. We have seen dramatic increases in the numbers of "newbies" (new users of the internet) learning how to use the automotive user groups on the net from the smattering of "techies" who used to be the only ones there. We have interviewed entrepreneurs who have collected large e-mail lists of potential customers shopping for cars on their new "28.8" modems. And we have interviewed surprised direct marketers whose respondents to magazine ads overwhelmingly requested product "brochures" on CD instead of on paper.

In short, the intelligent boxes are already out there, and the growing evidence is that user friendly interfaces are bringing large numbers of "ordinary Joe's" (a dealer's term) into the electronic world, *by*

allowing them to combine known experiences ---reading a magazine, visiting a dealer, reading used car classifieds, talking to neighbors--- *with novel experiences* ---getting car invoice data on line, talking with dozens of owners in user groups about their real-life experiences with specific car models, getting a trade-in quote on line, setting up a dealer service appointment by e-mail, negotiating a new car price through dealer e-mail, etc.

As the smart boxes begin connecting more media, like cable TV and on-line services, the rapid conversion of "traditional" customers to "wired" ones will become the norm. Customers will blend the known media with the new media, because it helps them with a very important purchase, and because someone can make money helping them do this.

WHEN WILL THIS BRAVE NEW WORLD TAKE OVER?---DON'T HOLD YOUR BREATH....TOO LONG

Just as many pundits have for years characterized the Russian and Chinese markets as "infinite and growing", there is a bit of a feeding frenzy surrounding the rapid growth of electronic media. Truly, many of the headlines of the past year have been hype, and many of the "immediate opportunities" have simply been "vaporware". It would be folly for auto companies and retailers to throw away proven methods in the face of highly publicized recent trends.

But, just as it was nearly suicidal for many companies to ignore the early warning signs from Japan in the 1970's, it will be equally disadvantageous for them to treat lightly the new market behaviors emerging from behind the computer screens in North American ---and European and Asian--- homes.

Many people will want "data" on these trends before they move to change traditional investments in old-line marketing, inventory management, and retailing. That is a well-directed instinct. But the true winners in the new marketing world will be those astute managers who can "intuit" the core trends from limited data, and place their strategic bets in the

right places........ just as fledgling TV network executives perceived the importance of television before there were Neilson ratings.....just as prescient telcom entrepreneurs saw the emerging billions in new services before anyone knew the price of an unregulated phone call....and just as new retailers in non-automotive products discovered on-the-fly systems to better match production to rapidly changing consumer tastes.

THE SECOND ENABLER:

UNBUNDLING THE FACTORY-DEALER-CUSTOMER RELATIONSHIP...

...RESURRECTING THE "BRANDING SOUL" OF THE INDUSTRY[6]

When one understands how the industry has been transformed in the past 30 years, it is easier to see the patterns forming the springboard for new media trends. The "soul" of the auto industry has been its branding....the unique combination of physical things, information, and emotion that has helped us distinguish Mercedes from Chevrolets, Packards from Studebakers.

There is a very specific "soul history" we can follow -- leading to the revolution of the 1990's.

THE ORIGINAL TIGHT BUNDLE

In the 1950's the relationship between car makers, sellers, and buyers was a relatively tight and friendly one. Car companies designed and built cars, provided information about those cars to the public, and provided support services (training and parts) to dealers. In the midst of a post-war euphoria and before the "safety wars" of the 1960's, dealers were honored members of the community and the friendly local face of the car companies. They helped families enjoy the new American (and European) prosperity, gave information to customers and fixed things that went wrong with the then-reliable American iron. Customers fell in love with cars, enjoyed the information and help they got from dealers, and waited anxiously for the great social event created by Detroit each year: the annual new model launch. Each year families bought new Keds and Peter Pan lunch boxes for the kids going back to school, and traveled to the local dealers to see the new models.

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[6] Credit should be given to Glen Mercer of McKinsey & Co. for well analyzing and explaining this trend.

Americans went to the local neighbor who had a TV to see the wondrous advertisements touting the new V-8's, fins, and electric convertible roofs. A very tight bundle indeed.

This bundle is central to understanding a crucial, but subtle, element of the new media revolution. In the old days the "brand" of a vehicle rested on this tightly knit fabric of factory-dealer-customer relations. A "Chevy" or "Ford" or "Dodge" brand was created by *a combination of the vehicle, the human interactions between the factory, dealer, and customer and most importantly....the information content that was intimately tied to the factory-dealer-customer relationship.*

Simple themes like "Chrysler engineering" could be conveyed from the factory, through the dealer, among customers who shared a culture based on industry-sponsored information and the word-of-mouth of customers, who would discuss push-button transmissions and hemi-head engines.

The General Motors "family" of vehicles had real meaning, because the dealer network and product features both embodied the clear graduation from Chevrolet to Cadillac.

Information content and physical content overlapped neatly. Compared to today there were few choices in vehicles, and fewer choices in buying experiences because images and objects were bound together.

"Branding" is a very complex, multi-sensory, phenomenon of emotion and logic, physical and mental processes. In the old "bundled" world, all elements of the auto environment were tightly linked because of the simplicity of both physical and sensory dimensions of the business. There were few sources of imagery (largely the factory), there were simple physical embodiments of this imagery (the car, the dealer, the advertisement). And there was very little information outside this tight bundle that could challenge the bundle.

UNBUNDLING THE INFORMATION CONTENT OF THE INDUSTRY

This bond was first shaken by the emergence of a separate information industry that was not controlled by car maker or dealers. Enthusiast magazines began to rate new models, and brought information to the public about new vehicle choices from Europe. The "safety wars" of the 1960's brought forth the government and fledgling consumerist organizations as providers of information that often countered the claims made by car companies in their advertising. Remember the debate over whether "safety sells" or not? Remember the government safety hearings on TV, and the detective GM sent after Ralph Nader?

In short order it became *profitable* to provide independent information on cars and on the car buying process.[7] A new industry was born to provide consumers with data they needed to shop better for cars....to get a more economic deal....or to provide for the safety of their families. The subtle process was underway and customers liked it.

UNBUNDLING THE PHYSICAL AUTOMOTIVE PRODUCT LINE

This information unbundling was accompanied by a physical unbundling of product lines, or vehicle segments. More vehicles (physical) became available to the public, at the same time that new acceptable customer thinking (information) became available.
Perhaps the clearest manifestation of market-wide product fragmentation was represented by the VW Beetle. The Beetle was a radically different car, but more importantly, created a radically different brand category *by managing information and product at the same time.* The car was different, but it rested on a successful advertising campaign that made it "neat" or "cool" for customers to see themselves in a small, ugly, economical "bug". Ugly chic. And it doesn't change every model year. A new culture outside the tight

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[7] Commercial sector information services could earn a good living. Public interest groups could get funds to publicize their agenda.

American bundle of Detroit factory-dealer-customer. A very different brand, based largely on a new information and sensory environment surrounding the different physical product.

More new brands came, expanding the sensory and physical diversity established by Triumph, MG, Mercedes. English Fords. Renault Dauphines. Saabs---radical "physical information"---an upside-down bathtub. Volvos----retro--- a modern rendition of a 1940 Ford. New information: front drive is good in the snow---our cars were built for bad European roads---they last forever. Advertising sensory images fit physical information of driving (these cars really were different from American cars.)

These European brand-fragmenters were matched by new brands from Detroit: Falcon, Corvair, Greenbriar, and a host of muscle-car brand derivatives. Both sensory information and physical product got more complex.

But brand complexity did not stop with collapsing industry-defined product segments. Customers fragmented products at an even deeper personal level. Customizing and "hot rodding" brought branded parts providers to customer consciousness. Remember the "Hurst" shifter, Hooker headers, Moon hubcaps..."branding" was brought to the component level, largely through cultural information flow among customers. A Chevy 409 wasn't really a proper one until you had modified it to your taste. You'd be embarrassed to drive a car unless you at least put a set of fender skirts on it---really cool was a "continental kit" spare tire. At the very least you'd punch a few holes in the muffler so it sounded like you had installed "glass packs".

Customers wanted brand control themselves.

UNBUNDLING THE PHYSICAL DISTRIBUTION INFRASTRUCTURE

At first, this "diversifying brand bond bundle" was a fragmented set of trends at the retail end of the business. But during the 60's and 70's, the power structure of the entire industry system was changed by successful dealers who began to establish diversified dealer organizations. Customers could learn the advantages of many brands from independent information sources, and they could buy different brands from the same dealer operation who had financial independence from the factory.

Dealers once thought it was important that a Cadillac was the high end of the GM brand family, and it mattered that they had an Imperial waiting for customers who had prospered beyond the Plymouth level in life----because customers believed the same thing, and dealers' economic lives depended upon fitting this brand clarity.

But with increasing diversity in the product, retail, and information markets, branding had become much more complex. *There were economic rewards for following the new customer-driven brand preferences---* and an increasingly independent retail sector shifted to meet the new cultural diversity in the marketplace. The parents could have a Ford, and the kid could get a Beetle ---or vice versa. The Chevy owner might aspire to a Mercedes. When the president of the high school class drove to school in a bug-eye Sprite...forget the Ford and Chevy ads, the kids wanted a bug-eye.

Smart dealers wanted to provide customers any option that fitted their cultural needs, so they began to configure an industry system that did not care about the 1950's logic of branding. *Dealers became capital pools that would buy and sell anything the new market culture wanted.*[8]

BY THE 1980'S, A COMPLETELY UNBUNDLED INDUSTRY ARCHITECTURE

Notice the progression. *Shifts in information technology* (independent data sources and new images) allowed *cultural diversity in customer buying* (get exactly

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[8] The ultimate influence of this shift is evident today. Many people do not know that there are a number of "car dealers" who are as economically powerful as some imported car brands: they have multi-billion dollar retail operations that are entirely self-financed.

what they need), accompanied by a *shift in physical dimensions of the industry* (more car types, more channels), all of which ultimately *shifted the entire industry structure.*

This opened the way to *completely new methods of competition to those who understood the equation.* By using an innovative service approach and careful information management, Honda turned a recall affecting several million rusty fenders into a huge information windfall: Honda changed the message from "our cars can rust" to "we care about you and the quality of your car after you buy it", and potentially offended owners spread the positive word about the company. They enlisted all elements of the auto industry system, including information, sensory, and physical to create a positive cultural event, reinforcing the over all brand. They did not simply hope "Mc Donalds -like" dealerships or some advertising would somehow convey the necessary message.

Market behavior of the 1960's through 80's strongly suggests that customers who had a variety of new information sources and cars at their disposal, came to attach "brand" feelings more to the specific vehicle they were interested in plus a number of cultural sensory factors meaningful in their own lives (free no-rust fenders, socially smart cars that didn't break down, etc.)--- and less to the factory logic used to structure the physical nature of the industry. *This is often described as "lack of brand loyalty". But it is perhaps more accurate to describe this fundamental trend as "loyalty to the consumer's own choice of specific vehicle and its attributes, instead of loyalty to the factory-dealer-customer bundle of the 1950's".* This seemingly semantic difference is important because it captures the customer's emerging behavior: customers came to seek objective information... which allowed them to compare vehicle features outside of corporate families...which then allowed them to select the closest match to their needs, from among a wide variety of vehicle "brands", and then seek the most pleasant way to buy that vehicle.

Therefore, customers appeared to care less about the company logic of physical distribution and retailing. They didn't like high pressure retail tactics, they no longer sought vehicle variety within one corporate brand family, so they began shopping through whatever channel gave them their choice of specific vehicle attributes.

Many car makers have never successfully solved this problem. They lost brand clarity in the retail channel and have provided very confusing mixes of car type and channel choice to the North American customer.[9]

Over the years this "unbundling" ---of industry structure and brand ingredients--- has only increased, and it became the dominant format of automotive retailing as the North American market globalized.[10] Importers, information providers, information channels, and many other players joined the prosperous and diversifying North American market, as entities beyond the direct control of factories and traditional dealers.

NEW MEDIA OF THE 1990'S: STARTING THE INFORMATION SYSTEM UNBUNDLING FOR THE 21ST CENTURY

The importance of the new media revolution is that it is starting a second generation of "information unbundling"

One dimension of the industry that did not change radically during the past two decades is the relationship among the core traditional media players: the car companies, the advertising industry, and the "media pipe" industries (TV, radio,

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[9] GM, Chrysler, Nissan, and Mazda were most often criticized for this in the popular press.

[10] During the early 1970's, with the advent of emissions and safety regulations, customers were no longer able to customize their cars. A period of relative homogeneity occurred. But it appears that the basic human instinct never went away, and as the US market opened to the world, customers continued to demand product uniqueness. This has been now supplied more by diverse car companies, not from aftermarket customization, and should be considered a basic tenet of global competition.

print). Despite the complete fragmentation of the product mix and physical dealer infrastructure, the basic media relationship remains as it was during the 1960's. Car companies send messages to the public through the advertising world and the large commercial media pipes.

The importance of the second information revolution is that it will not only fragment further the physical product and physical distribution sectors, it will unbundle the traditional media infrastructure by shifting it to user-controlled, two-way communication processes.

Branding's new focus

Why is "branding" so important in the new media context? New media will cause much greater variety of non-factory processes: seeking information about the car, developing a "culturally defined" sense about the car, buying the car through new channels, trading word-of-mouth through new cultural networks, and so on. In short, the collection of images, feelings, and experiences that represent a "brand" to a customer will come from a much wider variety of sources outside the control of the car companies.

The challenge to the car companies is to create a "brand" that can survive dilution from this new array of processes that touch and influence customers---while at the same time appealing to the consumer need for personal uniqueness that was manifest in the aftermarket customization era. And they won't be able to do this by changing the tiles, rugs, and signs on the dealerships....or by changing TV advertisements. The role of the traditional dealer and advertising will* remain important, but car companies must learn how to exist in a much different environment brought about by customer driven new media.

It is too early to begin predicting the exact consequences of these changes, but one can distill strategic direction by understanding the basic theme of the new media and by picking out the key "lessons" from automotive market history as it collides with new media processes.

THE GENERAL "POST ASSEMBLY" AUTO THEME: PUSH VERSUS PULL

Understanding new media can be very complex. However, strategically, the main point is simple. The new media allow marketing, distribution , and retailing processes to shift from a fundamentally "push" process, to a fundamentally "pull" process.

AFTER ASSEMBLY....IT'S MOSTLY "PUSH"

Despite a number of recent improvements, the current auto distribution model is one in which the factory "pushes" un-ordered units into dealer stocks that average more than 60 days' supply of stock (it would take 60 days at the current selling rate to draw the stock to zero)[11]. This is starkly opposed to modern manufacturing "pull" processes, in which parts are not made until they are expressly needed by the next upstream step in the production process. Factories now often run with hours' supply of stock, not anything approaching 60 days' supply. If you want to be a supplier to a car company these days, you must be prepared to operate according to some form of a "pull" system.

But if you are a car company, with limited exceptions you operate a "push" system with your dealers. Dealers must guesstimate demand often months in advance for the bulk of their orders, which means they are ordering cars for stock without any specific customers lined up to buy those cars. This is not some diabolical scheme cooked up by the car companies; it is a fact of life based upon previously inadequate information systems at the distribution and retailing end of the business, and poor connection to the complex customer buying process out in the market population.

If information systems could specify exactly when and where a particular customer would show up to buy an exactly-configured vehicle, then distribution most assuredly would be based upon the "pull" of this specific customer driven information.

Likewise, the current media surrounding this system are largely "push" systems---"Let me tell you how great this car is"---"Let me give you some cash back to buy the cars you don't want to buy at the current price". While the systems are staffed by very sensitive and tuned-in people, the overall system direction is still largely from the factory to the market. It is not fundamentally geared to getting granular information from the buying public in real time and integrating it into the production process. Advertising is not a "kan ban" system.[12]

This is where the new media systems come into play. Given the fact that new media are two-way, and touch users directly, the systems have the power to discern exactly when, where, what, and how customers will buy. If producers and retailers construct the right systems---ones that customers like and use---they can enter the buying process much earlier than they can now, and they can work with a customer until the actual point of sale of a particular car.

The economics of the current "front end push systems" lay the foundation for the benefits of new media pull systems.

"PUSH" COSTS TOO MUCH — FOR EVERYONE

The economics of the current distribution system show why new media can be so powerful, and why it is so reasonable to conclude that new media methods will continue to expand relentlessly.

Our field research has been directed at understanding the real-world economics of

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[11] What is worse is that direct measurement at dealers shows that the 60 day average is a combination of many cars that sell in a few days, balanced against many that stay in stock for more than 120 days. The actual cars in stock are evidence that the "push" is more wasteful than the averages suggest.

[12] A kan ban is a card that is passed from one station in a plant down to its supplying stations, to "pull" a batch of parts up from the supplying stations.

current push distribution practices. We have found that *the averages used by most top executives to understand the retail situation are misleading at best.* When one spends time in the market with dealers, it becomes clear that the current strategic control systems are out-of-date compared to industry at large, and are costing everyone too much money — from companies to customers.

Figure A: Local Inventory Distribution :
Typical Dealer

DEALER STOCK COUNT
EACH BAR IS ONE CAR --- HEIGHT IS AGE ON THE L

"E" is a fairly typical demand pattern; notice its regular steps of inventory age.

Model "G" is a high demand "mass market" car — and here is where the numbers get interesting in their detail. Notice that much of the stock is about 7 days old — these cars are just off the truck. Notice the next age step in the profile --- about 1/3 the number of cars in the five-week age bracket. This says that about 2/3 of model G sell within five weeks of their delivery off the truck. Those that don't sell in this early period tend to stay around for awhile.

The crucial discovery for us was that *the difference between a fast selling G car and a slow seller would often be only one option or one product feature* (e.g. manual windows, or interior trim color). This means two things:

Our most instructive finding is that *the industry is "drowning" in a stream that averages only two-feet deep.* It has been common practice to assume that a 60-70 day supply of cars on hand in the retail end of the business is an OK economic measure. This assumes that the system will make money, and customers will be satisfied, if the (push) system carries about two months supply of cars in retail -- optimizing customer choice and inventory carrying costs.

We conducted an interesting project that simply counted the age of individual cars in a sample of dealer lots. **Figure A** is a graph of the stock at one dealer lot --- a fairly typical dealer. Each bar in the chart is one car. The height of the bar is the number of days that car has been on the dealer lot. The cars are grouped by model.

Model "D" are the dealer demos, accounting for their high age. Model

- A small correction in information flow would change stock profile completely.
- Thousands of people in manufacturing had worked very efficiently, to make cars that were moving very *inefficiently* through the "front end" of the industry.[13]

At this dealer, the effect was even more pronounced for the F and T models. These cars were in very high demand — so many deliveries didn't even make it into stock, they were sold to customers directly off the truck. But notice the high average stock age of these models. *This is the ultimate irony — a dealer has aging stock*

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[13] This is by no means the fault of dealers or of any single group in the system --- it is a **system effect** that spans all manufacturing , distribution, and retail.

of a very "fast moving" car line. Again, the differences between the "instant sellers" and the "slow movers" was usually one or two option codes.

OK....so what? Isn't that what a distribution system is supposed to do --- smooth out the differences between factory schedule and "fickle" customer demand? As long as the averages are around that 60 day standard number --- many will tell us — the system should be working OK.

But our next level of research was even more surprising, in that it appears to completely destroy the common notion that people can make money and satisfy customers with a 60 day supply of cars in retail stock.

Our research design was simple. Activity based costing (ABC) has proven very useful in sorting out good from bad practices in the manufacturing world. What if we borrowed a simple ABC technique and re-calculated the cost structure at some retail locations to see what would result?

On average (a dangerous term) most dealers calculate *departmental* costs and profits (new cars, used cars, service, etc.), and they look at average profits per department. [14]

Taking our "ABC" perspective, we said "what happens if we charge costs to the *activity* causing the costs — stocking and managing inventory"? So we devised a simple method that allocates the cost of the new car selling department to the cars in inventory. In essence, we charge "per day rent" to each car in stock. We figured this made sense because it takes almost no effort to sell a hot mover off the truck — but it takes a lot more effort (sales time, land, financing, taxes, cleaning, bookkeeping, etc) to get a slow seller

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[14] Even on this basis, it is clear that many dealers make little money on new cars. Most dealers appear to survive on used car sales and service and repair. Long term capital appreciation often comes from the commercial real estate they own, not from the car business.

through a 120 day stock period into a buyer's hands.

Our first calculations literally shocked us. A "typical" dealer lost any chance of making money on some cars if they stayed in stock for 30-40 days --- far shorter than the "OK" industry standard of 60 days supply. We assumed we had made a mistake. But when we discussed these calculations with savvy dealers, they in essence said the numbers were correct, and they even managed their businesses with this in mind. [15] **Figure B** shows the results of our method applied in three different locations. *We must urge caution in looking at these numbers*, because we have looked at only a small fraction of thousands of retail locations. But, we now know *the 60-day number is certainly not a profitable industry standard for the new car departments* of most of the dealers we have looked at in our preliminary work.

Figure B: Inventory Age Cuts Margins Dramatically
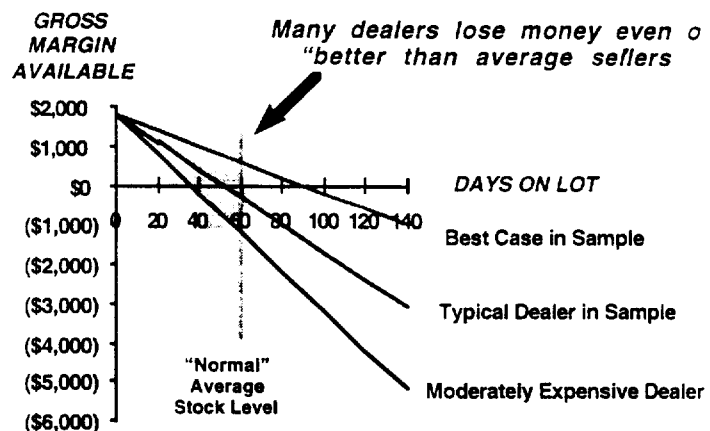
NOTE: PRELIMINARY DATA ; LIMITED REGIONAL DEALER SAMPLE

Since our early efforts, we have been collecting a wider sample of data, and we see that our early conclusions were probably correct --- but that *there is a huge diversity in dealer management processes*. Some dealers have adopted "Wal-Mart" style high velocity

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[15] For example, by taking slow sellers out of retail stock and putting them into subsidized leasing programs to get some cash flowing in around the unit --- instead of having it simply sit as a lump in stock.

techniques, which means they cut their per unit costs well below national averages. Other dealers explicitly "overstock", but compensate with very high profits elsewhere, and they use their high stock levels to become dominant *regional* dealers. If you drive 75 miles to visit them, they will almost certainly have the car you want in stock. They have chosen to re-arrange all the economic levers available to them, to create a market position that benefits their customers and gives them a durable strategic business. [16]

In short, even our preliminary work, and the work of many others, shows that the current push system is not economic. What struck us so hard in the field is how truly expensive the current push system is to everyone --- dealers, factories, customers. The only groups appearing to make money on the current system are the capital sources who finance excess inventories for dealers who can afford them — but even this is probably a short-range perspective.

Because the costs associated with the push system are so large -- and *because the solutions rest largely upon changes in information flow* — it appears very logical to observe that responsive new media systems are going to relentlessly take over the front end of the auto business, and link it more economically to the manufacturing end of the business. The exact pathway, however is less clear.

"PULL" ISN'T ALWAYS EASY...BUT IT'S INEVITABLE

On the surface, pull methods would seem to be of great benefit to everyone.

However, as with most new technologies, many current industry players feel threatened by new potential. In this case it is because new media appear to shift control of the buying process to the buyer.

Most traditional sales training material admonishes the sales person to "keep control" of the buying process: it assumes control equals closure. This theme really underpins the complex circus that happens when you try to buy a car at many dealers. They create a series of steps through which the customer must move, often continuing well after the "sales contract" is signed, in order to keep regaining control of the process in the event a customer "wins" a particular step[17]. The strategic problem with this is that most customers do not like this dominant sales process, which has damaged the overall popularity of the current automotive distribution system. The immediate problem for dealers, is that this process is very expensive on a per car basis[18].

New Media Solutions — Bumpy Start But High Payoff

New media is also subject to a number of false starts, because the nature of the technology allows people to quickly create new methods that simply don't work, like crude kiosks in airports[19]---which encourages threatened people to say, "see, we tried it and it didn't work".

Many will continue the traditional methods. But, to the extent they do, they

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[16] It is important to note that many dealers who achieve this are multi-brand dealers. And/or, they may have stretched the bounds of their franchise contracts to their limits. It is important to note that successful retailers often have to work outside the systems conceived by even well-meaning factory policies.

[17] One new age dealer compares this to the school bully process. If he tries to take your lunch money in school, but fails, he will accost you later on the way home where he is more like to win when the protection of school is absent.

[18] Our field research shows that it can often require 2-3 hours of selling time for a negotiation, frequently spread over many days. The process not only creates ill-will, it costs real cash, and slows down the "velocity" of the selling process, and the supporting inventory pipeline.

[19] One of the most absurd we have seen is a kiosk sitting in front of a duty free shop in an international airport. The user must painfully page through complex pages each showing one product, and then insert a credit card to buy something that must be picked up elsewhere. The customer could simply walk in the shop, scan the shelves, and pick out the product at the point of sale literally 30 feet from the kiosk. The cycle time of waiting in line is actually shorter than paging through the kiosk.

also create more room for innovators who will ultimately change the system.

Customer dissatisfaction is key to the success of Saturn and other innovators. Innovative processes, like ones used by Saturn, "give up" control to the customer, in order to gain a larger strategic corporate control over its own destiny. By allowing customers to do what they want during the shopping and selling process, the innovators ensure they get more accurate demand information, and a more motivated long term customer base, thus keeping ultimate strategic control over their long term corporate positioning.

"Pull" is good in this innovative environment. "Pull" allows a manufacturing organization much more control over its destiny by providing undiluted market signals to reach all levels of the supply chain. This is the essential lesson of the new media.

Unfortunately, in most large economic systems, it takes time for market shifts to be perceived by people who run the existing system. And the conversion from push methods to pull methods forces assets embedded in "slow sellers" to come under severe pressure. In this case, the new potentials will also threaten the existing jobs of many powerful managers in some of the world's largest organizations, shifting those job functions to new individuals.

Perhaps the greatest power struggle will occur when the new distribution systems demonstrate that some models are not selling because they are simply not wanted. In this case, the power of the market will not be diluted by 'massive "customer incentives" that tend to blur decision making responsibility. Now the costs of slow selling models are buried in the complex dealer network or "sloshed" across the whole auto making system. No one is given direct responsibility or cross functional authority to cut these costs. With pull retail systems, incentive costs will be directly linked to poor vehicle programs, directly challenging the investment in those programs, and the individuals who are associated with those

programs.[20] The automakers who can solve this inevitable cultural clash will be the ones who prosper in the next century; the winners will be those who can "pull" all they way from the customer to the iron mine.[21]

"Pull" is really a deep social trend: every retail product in the world is moving to "pull" from "push". Auto manufacturing has survived by converting to "pull", and automotive distribution will likewise relentlessly move toward "pull".
To understand how new media systems will reinforce the pull trend, let's examine the systems already in place. They represent tremendous raw material for the new media systems, making sophisticated market facing systems easier than many might think.
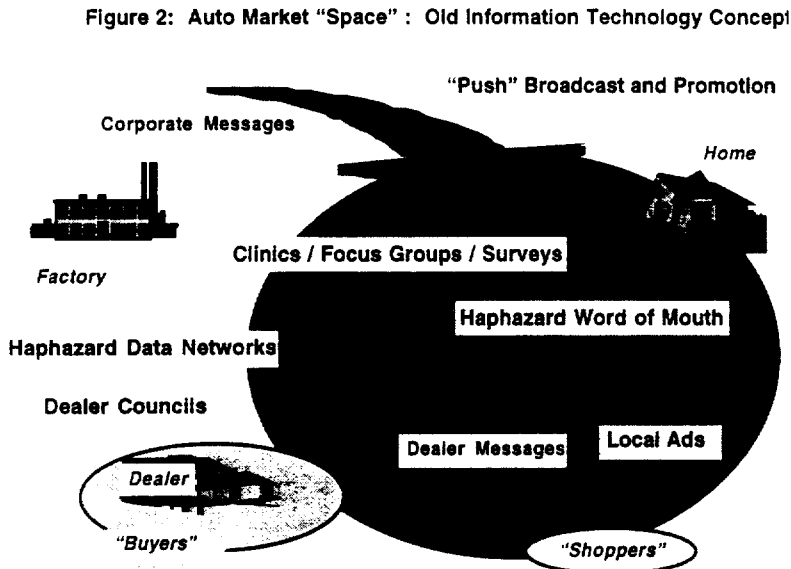
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[20] In other retail industries, like consumer electronics and computers, who sell through direct "pull" systems----the Wal Marts of the world----bad products are not made for long, because retailers simply won't stock them. In a true "pull" system, the retailer ---not the manufacturer---selects the ultimate product portfolio. This ultimately forces the product development function to get very close to the retail system, which is where many argue it should be.

[21] One can look to the consumer electronics business for models here. This business is "pull" over much more of the industrial chain, and successful companies are those, like HP, Motorola, and Sony, who can fit product development and manufacturing cycles to market cycles. As product cycles shorten in the auto business, it is increasingly looking like the electronics business.

WHAT IS THE "AUTOMOTIVE INFORMATION SPACE"

Software and communications developers often think in terms of "environments", loose aggregations of systems and technologies that surround a particular set of business processes or human behaviors. The environment surrounding the automotive industry contains many existing systems that can fuel the new media growth. **Figure 2** displays a summary of the traditional automotive information environment, including almost the entire value chain from component production through sale and use of the

Figure 2: Auto Market "Space" : Old Information Technology Concept

- Corporate Messages
- "Push" Broadcast and Promotion
- Home
- Factory
- Clinics / Focus Groups / Surveys
- Happazard Word of Mouth
- Haphazard Data Networks
- Dealer Councils
- Dealer Messages
- Local Ads
- Dealer
- "Buyers"
- "Shoppers"

vehicle.

Notice that there are already a large number of electronically based systems and methods in use.

PRODUCTION ORIENTED SYSTEMS

Systems have been well developed in the production and component supply chain for years. These systems include the electronic data interchange processes that link car company functions and link suppliers in a chain of production. They also include systems that manage and measure manufacturing processes.

Paralleling the production oriented systems, and the financial control systems are rapidly evolving product development systems, most popularly thought of as Computer Aided Design (CAD). In most cases these systems are entirely focused on engineering and production, with little connection to the "front end" or customer facing end of the business. An important detail to remember is that these systems almost always contain "hooks" that can connect them to other forms of data outside the production and engineering realm.[22]

DISTRIBUTION ORIENTED SYSTEMS

At the front end of the auto producing chain are systems designed to process orders and control stock shipments and distribution logistics: well-developed systems, containing considerable data base potentials. However, owing largely to cultural and corporate organizational factors, we find that their full capabilities are rarely used in practice. For example, inventory control systems can track the actual movement of individual units, and incorporate data about the costs of shipping, holding, and selling individual units.[23] But these capabilities are rarely used to decipher the details of stock movement and cost in the retail part of the chain. Most often, the output of these systems is used in broad forecasting and planning mode.

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[22] For example, CAD systems contain the ability to incorporate "features". These are intended to be standard engineering items such as "holes" or "shapes", but these software hooks can be used to incorporate other data items like customer requirements and market price limits. Activity Based Costing Systems can be modified to include similar market-derived limits and constraints.

[23] Our research shows they could be used to create "activity based cost" systems like those in manufacturing.

Beyond the factory gate are many "pipes" and "applications" that seek to link dealers to the factory, and to link portions of the retail chain to each other. Some are factory systems, often conceived according to the vision and business targets of the factory. Many are derived by third party systems providers who sell independently to both car companies and dealers. Still others, usually at the retail end of the chain, are created by local application developers who build systems to track sales prospects, manage service parts and warranty claims, or control the finances of a dealership.

Related information technology systems are developed by the transport companies who carry vehicles to and between dealers. Some of the most modern versions of these allow "Federal Express" style tracking of shipments in transit.

One strategic characteristic of all these factory and post-factory systems is that they have usually been developed to solve some local or functional problem, and therefore the systems are quite fragmented and not created to link with each other.

Their other strategic characteristic is that no matter how well-connected they may be, they stop at the showroom door. They are industrial systems, not market-linked systems.

"NON-SYSTEM SYSTEMS"

The remainder of the industry-sponsored automotive information environment is made up of a wide variety of largely traditional communications media and "sneakerware"....the interaction of human beings without automated systems involvement.

Most massive of these are the advertising and promotion environments surrounding the auto business. While this is a multi-billion dollar industry unto itself, with great complexity, it can be boiled down to a two level communication environment. At the national level is the array of company sponsored advertising and promotion, the TV and print ads we are all

used to.[24] At the local level is a wide array of dealer-driven advertising and communication, largely designed to capture customers for individual showrooms.

Not often thought of as "information technology" is the good old "snail mail" postal service, used by both the national and local organizations to reach out to customers directly. While it does not travel electronically, this is clearly a large part of the information environment.

Also included in this area of the environment is the "publishing" part of the information environment. This would include the various consumer oriented publications, the enthusiast press, government publications, trade press, and a host of other information sources.

While the information processes of the communications sector are highly refined, many are extraordinarily expensive compared to emerging systems. National advertising runs into the billions of dollars yearly. Direct mail campaigns and newspaper fliers easily cost several dollars per quality response. Urban car dealers often spend thousands of dollars per week on local advertising.

Most estimates suggest that in North America, the cost of each car includes between $500 and $1000 of advertising, promotion, and communication.....not including the financial incentives used to move slow selling vehicles[25]. This suggests an annual communication bill of about $10 billion or more for the North American auto business. As a point of comparison, all the glass in these cars costs around $3-4 billion per year, tires might be $3-5 billion per year, auto sound systems perhaps $7-9 billion. There are many component suppliers who would like just a fraction of the money spent on

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[24] Also included in this array are outdoor advertising, and a host of promotional products like T-shirts that are designed to reinforce the broad information content of the auto business.

[25] Special promotions can double this. The amount obviously varies by volume of sales and popularity of vehicle.

advertising and communication "information technologies".

The above forms of media and information technologies are almost exclusively "push" technologies. That is, they push a message from the factory, dealer, or information content provider to the customer. In the traditional information environment, the only forms of media that reach the home are these push format technologies. To the outside observer, the corporate culture that pushes production volume into field stocks is also calibrated to push information messages out to the marketplace.[26] Very little of this traditional environment is interactive.

In truth, there is an interactive portion of the traditional information environment. This is perhaps most easily characterized as "market research". Car companies have very sophisticated means to analyze demographic profiles of markets and customers, and they conduct a wide variety of "clinics" to test product features. The main problem with these interactive methods is that they are indirect and quite expensive. They are indirect, because they work from indirect survey samples of shoppers and buyers and, they are expensive in that it costs millions of dollars to get enough depth and sample sizes large enough to get the kind of predictive accuracy to represent a direct connection to the buying public.[27]

Historic interactive information technologies are also notoriously slow. It takes months to prepare good surveys, months to digest the results, and often at least months to argue over the meaning of the output. If you're trying to cut a 60

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[26] While marketing types will often characterize some of the promotional efforts as "pull"---- designed to get the customer to "pull" a car through the pipeline by getting excited about it and then going to ask a dealer for it---the information process is still very much push: the message is pushed out there into the environment toward the customer.

[27] Single focus groups, involving say a dozen customers can easily cost tens of thousands of dollars. Large scale surveys, with phone follow-up can run into the millions of dollars.

day supply of inventory, you need much faster market information systems.

CUSTOMER CONTROLLED "INFORMATION SYSTEMS"

Beyond the industry-sponsored portion of the information environment is a massive, crucial, and largely overlooked "information system"....the word-of-mouth communication among more than 100 million vehicle owners, or more than 200 million passengers. Active car shoppers seek information wherever they can get it as they try to narrow down their decisions. But, even beyond active shoppers, it is difficult to envision a cocktail party or social gathering without some discussion of cars in the crowd.

Figure 3: New TWO-WAY Technologies Emerge
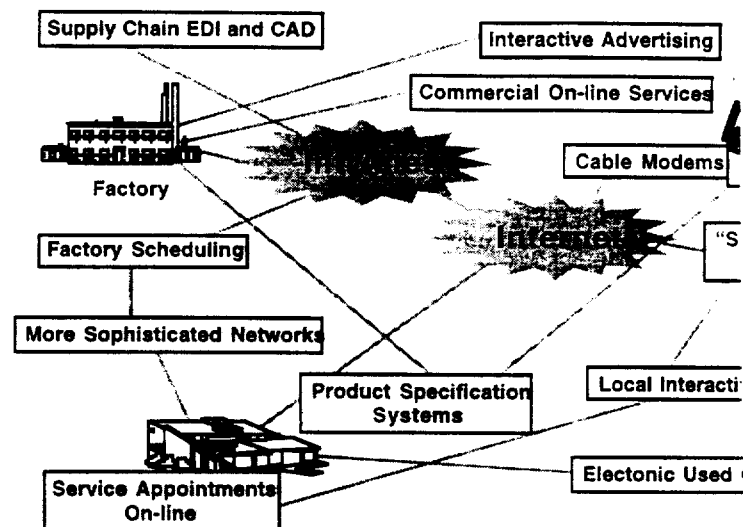
The main attribute of word-of-mouth information is that it is often more credible than industry sponsored promotion.[28] Even if it is objectively incorrect, it may have more weight than corporate communications because it carries social content, and people often care what others think about the car they own. Another characteristic of word-of-mouth dialogue

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[28] Recent typical survey results. 63% say advice from friend or relative stimulates interest to buy. Only 25% for TV, 15% for newspaper ads. Yankelovich survey. Wall Street Journal, October 17, 1995

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is that it can reveal very direct information about buyers' intention to purchase, desired product features, or other pertinent information.

We have tried to indicate some dimensions of the word-of-mouth information sector in **Figure 2** by the shaded areas marked "buyers" and "shoppers". Each year there are about 15 million vehicle buyers in the North American market. But most market research indicates that for every active buyer there is at least one person "advance shopping" for a vehicle to buy within months.[29] The information circulating in this group could be very useful for the car industry system, in that it would help plan production, feature mix, and buying method or location.

If there was a practical way to capture the billions of informal information transactions each year among the population at large, it would be much easier to run the huge industrial systems that produce and deliver cars. Until now, this was an unthinkable ideal.

But the world is changing, and the impossible may soon become the practical. **Figure 3** shows the addition of new media and new information technologies to the auto information environment.

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[29] "Intention to buy" data are notoriously soft and variable, but simple analysis of the overall buying cycle suggests these rough estimates are accurate.

INNOVATION IN THE CURRENT AUTO INDUSTRY "SPACE"

So...the automotive information space is littered with latent systems, waiting to be connected by innovative people and organizations. With the internet revolution of the mid-1990's, this is exactly what is happening. Following these innovations is like trying to keep track of nuclear explosion, but the main categories and prime innovators point the way. The most important innovation is the unbridled spread of a new information technology architecture — an open architecture spawned by the internet vision.

OPEN INTERACTIVE ARCHITECTURE INSTALLED IN CUSTOMER SPACE

Physics teachers often describe a situation in which a lake has been cooled to a temperature just below freezing. If one drops a pebble into the water, the lake will suddenly turn to ice. Something very similar has just happened in the auto information environment. In one stroke, new on-line, internet, and related information technologies are exploding around smart boxes in the home. This has several crucial strategic meanings.

- One, interactive communication potential has just been installed in a portion of the information environment where it did not exist before...out there in the market population.
- Two, this technology allows links to every other portion of the automotive information environment, without exception.

Shortly, the information environment will have the ability to directly tap into the word-of-mouth segment, and into the very early stages of the shopping process among customers. And, the information traded in this sector of the environment will be exchangeable with even the most distant portion of the system, deep in component suppliers' factories.

The same style of "open architecture" technology that is a novel wave in the home can be equally well applied to all of the other portions of the information

system: in the dealership, on the trucks carrying cars, in the assembly plant and car maker offices, throughout the component supply chain, and at all stages of the current communications industry. The nature of the new software is that it uses very simple, easily written "middle ware" to connect data bases that previously could not be connected.[30]

Many have likened the new "internet" technologies to the invention of the printing press, when human communication moved from word of mouth and singly-scribed pages, to mass produced information processing. It actually might be more like the "multi media" revolution of the later 1800's in which movies brought new dimensions to reliable human communication. And, the information shift represented by ubiquitous interactive technology also contains elements of the transportation revolution that brought us the car in the first place, and which revolutionized the industrial revolution.

However one characterizes the phenomenon, it certainly has deep industrial ramifications. Let's review some of the actual innovations taking place, then examine their implications for the auto industry of the future....one which can now become truly "market facing"....one in which the "push" front end of the value chain can become truly "pull".
There is a logic to our review. The major innovations are happening within the customer space. One step up the industry chain are innovations in the showroom, and then in the distribution area. At the next level, these market-facing innovations will spawn changes in manufacturing and vehicle design methods. Our purpose here is to chow how changing customer behavior, simultaneously allowed and supported by new media, will soon link all innovations in the chain.

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[30] Software professionals will recognize this as an oversimplification. But it is true, that "internet style" software can link disparate data bases as long as certain keys are laid on top of them. The data bases are not integrated they are linked via specific questions.

CUSTOMER FACING INNOVATIONS

On Line Access

The basic change is massive growth and flexibility in on-line access technologies. On-line service companies like Prodigy, CompuServe, and America On Line (AOL) have been around for years, however for reasons not yet fully explained, they have achieved huge growth in the past two years. There have always been automotive data and chat categories on these services, but owing to the relatively low penetration of the services themselves, and to the fact that these proprietary systems were self contained and not linked to the rest of the automotive information environment, they did not represent a powerful force.

The pebble in this nearly frozen pond was the popularization of the internet, which has forever broken the boundaries of the proprietary networks. In late 1994, the "in a box" kits allowed non-UNIX folks to ply the net, which provoked more nets to join the net, which provoked more people to join the nets, which provoked high speed modems to become cheaper, which made it more fun to surf the net, which brought easier software to the net, which provoked more people to join the net......and so on....... Because the internet is like the wide open prairie compared to the tight alleys of the proprietary networks, users have forever rejected being cooped up between data walls. America On Line, Prodigy, CompuServe and others have been forced to join the net, which means even their private networks are now linkable to all aspects of the information environment. In less than a year, human contact with the tens of millions of installed computers was changed forever.

Dealernet

One of the first major automotive applications to make use of this new connectibility was Dealernet. To oversimplify, Dealernet was a software application that dealers could install on their existing (cheap) PC's which would create an internet presence for them, link them to everyone else in the Dealernet chain, link them to the central Dealernet

servers that performed certain services for them, and simultaneously open them and link them to everything and everyone else on the net. Now it just turned out that for reasons mentioned earlier in this article (customer information seeking, and auto as an information intensive product), this service began to act like a huge lightning rod that attracted millions of people searching the new environment for things automotive.

Each dealer who was on the service could tell millions of people who they were, and could begin to let customers interact with them electronically. Although the product is still in its roll-out and development stage, the services it allows are instructive. If a dealer so chooses, he/she can not only provide product information, buying information, and location information to remote potential customers, the dealer could allow customers to engage the service department, the parts department, and any other function in the dealership. In its ultimate rendition, customers can arrange service appointments, and can get all kinds of questions answered without having to travel over to the dealership, or catch someone live on the phone. ("Non-simultaneous dialogue" is a big feature of new media systems, which saves both dialoguers time and money).

In addition, owing to the combined architecture of Dealernet and the internet, customers could access dealers, car producers, other car information sites....in short a whole range of information sources that were hard to get to beforehand.

And the dealer could do all this for several hundred dollars per month. Dealers can now get responsive classified advertising, with dialogue and specific customer information, for pennies instead of thousands of dollars. Customers could interact with dealers in the security of their own home, instead of the negotiating environment of the showroom.

Dealernet is not "the" answer to the information explosion, and there are a number of worthy competitors appearing as this article is written, but in one fell swoop it provided the new paradigm for dealer relations with customers. Along

with others, it created the 1990's version of the factory-dealer-customer bundle. Unlike the bundle of the 1950's, this bundle is user controlled, rewards accurate credible information, and allows maximum flexibility for all parties in the bundle.

Dealernet, and its sure-to-come colleagues have provided a method to improve and inform all that "pre-buying tire kicking" that customers have been doing. And it allows prescient dealers cheap effective ways to redefine dealer operations in a truly customer driven way.

Other nets

About the same time that Dealernet rose to public prominence, other forms of auto related "nets" appeared.
Some car producers quickly provided dealer locators on the internet.[31] Customers can now instantly see all the dealers in their area. This has always been available on paper, but now the speed and ease of access have been increased dramatically (Try asking a dealer for the company-provided booklet of all his competitors in the area). Even this innocuous "advertising" move has some hidden implications. For example, in the (quite common) circumstance a buyer did not know how many dealers there were near him, he/she now has a ready list of dealers to search and negotiate with.[32] If the slightly distant dealers are "on the net," they suddenly have extended their geographical market reach. The chickens and eggs add up again. In a free market driven by customers it will not be long before all players will be working to a new standard. The irony is that companies will have to provide this simple information in order to remain of service to customers, and given the stakes facing customers, they

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[31] This has changed several times already. The simple service has proven surprisingly "political" because it gets at the heart of who controls retailing.

[32] Don't underestimate this. Yellow Pages in their paper form rarely show all the make dealers in an urban area. On-line locators easily display more dealers than one finds in each local edition of the Yellow pages. Market research clearly shows price sensitive buyers will travel far to get a better deal.

will always use even simple information to their increased advantage.[33]

In parallel, groups of dealers (the "auto mile" folks) banded together to list themselves on the net. If the factory-created listings don't provoke the holdouts to get on board, competitive dealers will.

Then came a major step....*stock locators on the net*. Most dealers would be financially hard pressed to list each and every car they had in stock in expensive classified advertising. But on the net it might cost a dealer a total of $29 per month to list every item he holds. So some did. And some visionary local dealer associations or listing services erupted with the same idea.

And if it worked for new cars, why won't it work for *used* ones? So more listings cropped up. And, it costs a private owner about $35 to list his car in the local newspaper. Let's see.....it costs about $30 dollars per month to rent a web site with 10 megabytes of space (easily several hundred pages of information), and there are all those people paying newspapers $35 per listing. .... So internet classifieds are emerging, at much better than newsprint economics.

And around the country dealers are regularly making twice the profit on a used car that they make on a new car. So they are increasing the volume of used cars they are selling (some are now selling 750 to 1000 per month). So it gets tougher to find used cars. "Hmmm.....I can make several thousand dollars on a used car and it costs me much less to transport it from someplace around the country." So *used car buying services* are hitting the net.

And dealers began to realize the net could extend their geographical reach. This is good. So they signed up with the emerging selling services that were

capturing lists of potential buyers on the net.

Changes in Customer Behavior

Let's shift gears here a moment before describing systems innovation higher up the chain. *Simply the changes we have described so far are allowing and prompting very different customer behaviors, that will affect the industry-sponsored innovations farther up the industry chain.*

Let's take a look at some of this new customer behavior, and its first influences on the industry system.

Picture yourself as a buying customer. It's raining. Like millions of others you know buying a car is a negotiating process, but you're not up for tire kicking and dealing with salespeople in the rain. So you hit the net. You point and click to open your connection. You point and click to open your browser and find a net search program. You punch in the word "automobile" and click your mouse. You suddenly have several hundred listings on your screen. with some more points and clicks you find some of the services most relevant to your buying interests. (You might have also clicked on the "Hummer" symbol on the Dealernet brand listing page just for fun, as have thousands of others, but you move on to your brand territory.)

You've seen your desired cars on the road, and looked at them in parking lots. Maybe you even drove one owned by a friend. Or maybe you owned one like it in the past. You already have some pre-stored sensory input on the vehicle. Now you check out what the manufacturers say about their cars. Dig into several of the on-line consumer data bases to check crash tests, reliability, fuel costs, etc. The enthusiast press on line tells you about speed and fun to drive stuff.

Next stop, the user groups in which people talk about their car winners and losers, and in which service recalls, hidden warranties, and all kinds of other information are

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[33] As we write, some dealers are resisting this factory-provided locator service. This is the old "control the customer - limit the information model", and it is sure to lose out in the modern information environment.

days to get in the past, and you have some information you never would have seen the last time you bought a car. And you've got a pretty darn good idea of what you want.

And you have some dealer e-mail addresses.

Are you going to visit a dealer now? Maybe. But since it's free you might just e-mail some of these dealers with your interests and then go watch football while it continues to rain. Increasingly, these dealers might e-mail you back. And since there's not much to lose, you might try negotiating some prices based upon what you found on the net.

Picture the dealer. Someone just expressed e-mail interest in a car, and instead of costing him the sales time of a salesperson and a sales manager, this expression of interest cost him just about nothing. Will he answer the e-mail? Ever see a sales person turn down a lead? Will he negotiate? Is he going to risk losing you to another dealer? Most likely dealers will try to make something of the lead, and that means engaging in the negotiation. As more dealers go electronic, the system will equilibrate around the new

listed on the vehicles you're thinking about. (See **Figure 4**)

You find some dealers near you. You check some private classifieds to see what others are asking for your type of trade-in. You find the several services listing dealer invoice on the cars you are looking for. You might even get a quote from a buyer on your trade, but if not you can still find "blue book" values on your used car.

Figure 4 shows some selected samples of the hundreds of discussions users can find using simple point-and-click searches.

After about 30 minutes, you've got the kind of information it might have taken

customer standard.

In truth, not much has changed in this scenario, compared to the old days, except the speed and quality of information has jumped dramatically, and the customer has gained more control. Dealers may not like this too much, but in truth they were having to behave this way even in the old showroom transactions. And in this scenario, the costs of the selling process can drop dramatically, leaving the dealer more profit at a given discounted price.

Figure 5: Emerging Networks Create Many Systems and Services

Suppliers Forecast Repairs   Conduct Product Clinics On-line

Buy Cars On-line

On-line Finance

Factory Tests Colors On-line

Local Dealer
CATV -
Internet
Links

Dealers Start Own Stock Transfer

Local Dialogue With Sales People

Customers Search Inventory

Electonic Used Car Auctions

Owners Schedule Service On-line
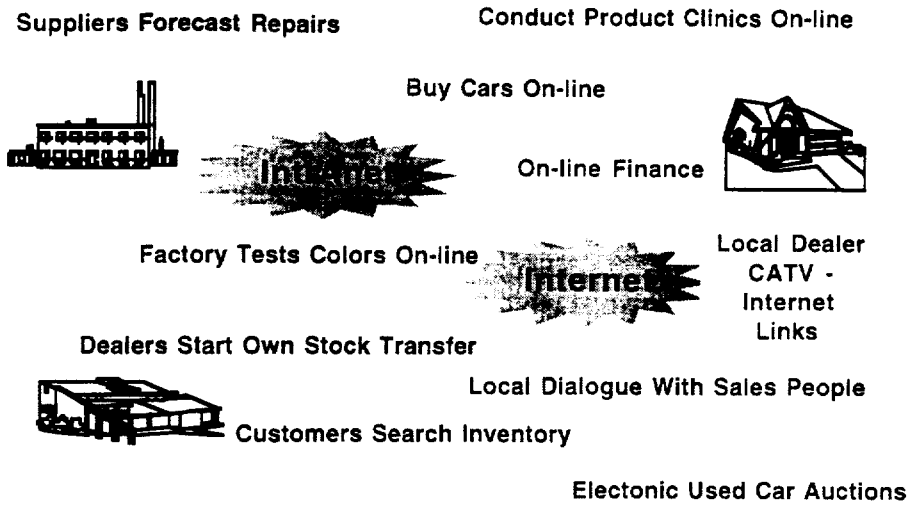
Let's see how the changed customer behavior links to current and pending innovations further "upstream" in the auto industry. Our point here is to show how the basic customer behavior changes allow many things up the chain to be linked in "new paradigm" ways. (Figure 5 illustrates some emerging linked services)

As the buyer, you will probably want to test drive the car [34] · and you might have to still visit some other dealers to really negotiate. But if you do, you will do so with the information and the "practice" from your net sessions backing you up.

On balance, the new capabilities can provide benefits to all involved, except to those (like newspaper classifieds) that were getting pretty high rents on the old less efficient process.[35]

Is it really too extreme to say that in one move, the entire front end of the car buying process has been revolutionized? Disagree? What about when this capability hits the interactive cable TV in the next year or two? Remember Home Shopping Club? Think about Land's End, LL Bean, PC Connection, and a host of others.

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[34] It is often assumed that test drives are part of the process. However, our dealer interviews reveal a number of dealers who say a test drive is not mandatory for every customer. One participant in the ICDP, who is one of the largest car dealers in Europe, recently noted that fewer than 10 percent of his customers take a test drive before buying the car.

[35] Although it is hardly a scientific study, this author sold a large quantity of unused sporting equipment in one week over the internet. This material had been listed frequently in classified advertising and local paper bulletin boards for two years previously.

POINT OF SALES INNOVATION

Vehicle Specification Systems: Tremendous Two-Way Potential

One of the key problems in executing a sale, especially if it is for a car not in stock (car ordered from factory or from another dealer's stock), is getting the customer the exact configuration of vehicle he/she wants. Even though options packages have been simplified in most vehicles, it is quite typical for a customer to ask things like "can I get the towing package with the sport interior?" If a customer wants a feature, the sales person really needs to know if it's a possible combination, and human memory just isn't good enough. Therefore, a major effort is underway to have all the possible vehicle specification combinations easily accessible on line at the point of sale. In some cases, this helps "objectify" the relationship between salesperson and buyer: the salesperson does not need to rest on personal credibility (or faulty memory) and the customer feels he/she is getting straight information. This innovation also helps dealers with costly staff training. The sales person merely needs to be trained how to use the computer, not how to memorize complex and changing product specifications.

The intended use of this technology is good. But its ultimate potential is huge. What if the spec-ing system could be made more accessible to that front end internet buying environment mentioned above? There are risks, but in an interactive environment, the same program that is used in the show room in single transactions, could be extended to capture detail on customer feature preferences very early in the buying cycle. Without much imagination, one can see that connecting this "industrial" system to the "market" systems could have very powerful results.

Right now literally millions of customers express preferences in showrooms, and these data are never captured. When a customer says "can I get the towing package?" he/she is conveying a specific feature interest. What if millions of these could be captured through a mirror use of the spec-ing programs? With such large samples, trends and intentions of actual buyers could be recorded and interpreted in real time. Compare the cost of this transaction to the cost of setting up a much less direct and complex survey response.

There's an old joke about how the government game wardens count the number of antelope in a moving herd---- they count the number of legs and then divide by four. That's current market research compared to capturing real time data in the showroom, or even earlier in the buying process.

Sales Desk Top Links Market to Industrial Systems

Another innovation under development is often called the "sales desk top interface". Picture a simple touch screen computer on the sales persons desk, with a number of buttons on it. A customer walks in saying he saw something on the net. Push the "internet" button and explore the net with the customer. No damage to sales credibility: accurate and honest transaction on both sides.

It's raining, so people are sending you e-mail trying to negotiate with you. Push the e-mail button and you can see how many buyers are out there (and what your earnings for the day might be if you successfully negotiate with them). Or, because it's raining and no one is visiting your lot, you call up your regional customer data base and send people a friendly contact message that is not anywhere near as intrusive as one of those "hi how are you doing" phone calls.

Another customer asks the "towing package" question, so you push the spec-ing button and get the answer. Yet another calls to know when his special order is coming in; you punch "orders" and get a direct link to those information pipes at the factory or the transport company.

Another piece in the new media puzzle fits into place. Sales desk systems can easily smooth customer relations, and provide one more bridge to the churning market.

Connectivity is good. Speed is helpful. And costs can be reduced if the new systems are designed and used well.

DISTRIBUTION SYSTEMS CHANGE TO MEET MARKETS

One step up the line, in the distribution portion of the business, other major shifts are taking place. Perhaps most well-known in the car business is the European shift away from dealer inventory storage to regional "stocking pools". Although the details of this are complex, the strategic view is straightforward. In the old system, dealers ordered cars from the factory both for waiting customers and for their inventories, or stocks. This meant each car produced was identified with a specific dealer and not available to most other dealers in the system. Even if another dealer had a waiting customer, and you did not, he could not access your car in the pipeline. When a customer walked, the dealer could only draw upon his units, in stock or on order---typically 250 units for an "average" dealer.

In the new system, the units in the pipeline are not identified with a specific dealer unless a customer there has put up money for the car. Dealers can now draw from the whole national pipeline. The math is extremely simple. Each dealer has not just

250 units "on call", he can have several thousand units available (in the old system they would have been "owned" by other dealers). This dramatically increases the probability that a dealer can quickly and exactly match each customer's need to a unit in the pipeline. So far the result has been to make the customer end of the business behave much more like a custom-order system , but it simultaneously makes the demands on the factory smooth out -- they are getting much clearer information from the market, undiluted by the confusing effects of dealer-held stock.[36]

The main point: this only required a small change in the existing information system, to create a whole new industry capability. The dealer ID was removed from the equation, and the whole system got simpler. [37]

While there is hot debate among auto companies as to whether this exact system will work for them, the overall economics argue strongly that some version of this information architecture change will be undertaken by almost everyone over time.

Now, what happens when you combine this much more reflexive distribution system, with the new information transaction potential of the front end innovations discussed above?

It seems exceedingly logical that if you improve the speed and quality of information in the market and sales portion of the business, and you have a distribution system that responds well even to poor information, then you have a winning combination with good information. Given that such combined systems can improve costs by perhaps tens of billions of dollars, it seems safe to bet that market forces and good business sense will use emerging improvements in the information environment to create very effective distribution systems. If spec-ing

and shopping systems can be ported to distribution pooling, the combination can only be an improvement.

Used Vehicle Markets: More Demand for Linked Systems

You as the customer, may easily be deciding between a new car and a newly used car. And in most cases your purchase decision will involve getting rid of your old car. This means your "rainy day" shopping behavior can connect to one of the major industry innovations, the professionalization of the used car industry.

The economic drivers are in place. Used cars are more profitable than new, and more economical for many buyers (they avoid a hefty depreciation charge, and benefit from the increased quality in today's cars). This has led to one of the most talked about innovations in the North American car business: the professional used car retailer.

Most publicized is Car Max, a new "franchise"[38] created by Circuit City. Without getting into the very interesting details, suffice it to say that this event was founded largely on sophisticated used of information technology. Car Max has used information technology to capture customers, and to capture large numbers of high quality used cars. As we write, there is a high probability this systems-based business will expand rapidly beyond its experimental plans.

Right now used cars come basically from auctions around the country, or from private citizens (trade or private sale). That means it is costly and time consuming to get consistently large numbers of them.

This fact is not lost on the used car industry. Enter again the speed and credibility of information.

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[36] See ICDP working paper series.

[37] The amount of cultural change required to implement this is actually tremendous. But the basic seem change is so simple and elegant that it is much more likely to ease the cultural problems overall.

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[38] Technically, this is not a franchise, but a wholly owned system. But the concept is as professional as any of the new car franchises.

One company is beginning to offer dealer used car auctions via video link. That means dealers can sit at home and bid on cars thousands of miles away. The service company employs inspectors at the auction, so the dealer gets a real person to inspect the car before it is shipped. Then the dealer gets right of refusal when the car actually arrives at his lot; the remote auction company will take it back.

At first this sounds like a risky business. But when you consider the scale, speed , and quality of information the auction service has available, the risks are isolated, and are quite "insurable". The service company obviously has a large number of buyers accessible in his "net". He also has several physical check points (inspectors) to reduce the obvious risks (a really bad car). Therefore, if a dealer refuses ultimate delivery, the service company has a ready market to clear the vehicle, possibly at a lower price. The only cash at risk is the cost of transportation (surprisingly low in a well coordinated info-tech supported transport system), the cost of the transaction (the fractional system cost allocated to the transaction), and not much else. In a large enough system, with speedy credible information, the risks are clearly no worse than bad debt kinds of risks in large credit card systems.

With rapidly expanding internet used car listing services and others, one can safely predict that the used car business is rapidly on its way to a national professionalism not seen before.

SERVICE AND REPAIR

Remember Dealernet that allowed a dealer to open his service department to the net, and that sales desk top that puts all the systems in one place? These come into play in the very big business service and repair area.

In the old system, a customer called up, and talked to a phone person (often not a trained service technician). Then he/she comes into the dealer and waits in line to get "written up", probably spending time trying to describe the sound the car is making. Then the dealer has to diagnose the problem and get the right parts, and so

on. In all, this is a pretty time and labor intensive set of transactions. Dealers who measure it report that the old wait in line approach often takes 25 minutes per transaction.

But say this dealer has a Dealernet-like opening on the world. Customer "nets in", sees a menu of possible services, or of possible "complaints" (the brakes squeak). Point and click on the relevant items. Then get a real time version of the dealer's calendar, showing the open time slots. Pick one and point and click. Now the customer has just done at least 50% of what he would have waited in line for, and the dealer has an advance diagnosis (get the parts ready). All the documentation, including any warranty work, is done in advance, and everything is much more predictable.

Move one step up the line into parts distribution. Right now demand occurs as customers come in with problems. Urgency is created. The system has to respond rapidly to unknown data. Under the new system, there is at least some window on parts needs well in advance. This works very much like the new European car stocking system. Fast and good information increases, and system cost decreases.

MANUFACTURING INNOVATION

Let's take one more step up the line to the manufacturing organization. Clearly the market-reaching technologies, and the point of sale technologies have the potential to capture tremendous detail on what customers want in real time. Remember that these outreach technologies also can be fitted to the product spec-ing programs and the distribution systems.

This means we are probably due for a major strategic shift in one portion of the market research business, that portion that tries to help car companies set annual planning volumes and schedules for the thousands of component suppliers. If the front end technologies can lock into buyers and shoppers in real time, we eliminate the need for the vast amounts of

surveys designed to guesstimate demand patterns.

This means a portion of what is now the "marketing" function gets fully integrated into a cross-functional "system management" function. It also means major changes for "logistics" functions and for inventory expediters (just as just in time did the same within manufacturing). It's been very popular and useful to redefine business according to their processes in recent year. Here we have an emerging example of a major process re-definition. The speed and credibility of new information, and the open fluid architecture of internet like software will mean major parts of the auto system can be managed in completely different ways. The market facing functions join the production functions.

PRODUCT DEVELOPMENT

There are new vistas opening here too. For years there have been efforts to create integration between Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM). While there have been many failures in this effort, there are now major advances happening that mean early visions show promise.

Here's a really "out there" idea. The mathematical models that are used to create design shapes in CAD, and manufacturing process in CAD, are very much the same as the mathematical models that are used to create much of the new media....the three dimensional visual representations now being churned out by advertising agencies, and the internet type developers. In the CAD and CAM world, design features and production control process are keyed to points on the CAD and CAM models.

Real world experiments are showing that you can take the core of car design type models and use them to create artistic renderings of vehicle and vehicle options, for posting in the new market reaching media....while retaining the manufacturing and design related control points.

This means that *in the correct system, one could publish many designs for public view, and potential customers can react*

(point and click) to things they like and don't like.....in a format that is easily translatable back into the engineering and manufacturing realms of the industry. In practical terms this means design engineers and manufacturing process engineers can directly participate in "customer product clinics", with tens of thousands of customers, with great speed, and possibly with much lower cost than in current "car clinics".

In other industries, such as consumer electronics, similar systems are being worked out right now, and it is not such a leap to carry the concept to the car business.

CHANGES IN THE "NON SYSTEM SYSTEM"

How will our new customer behavior affect the current "media" industry?

It is highly likely that the entire media industry as currently configured in the car business is in for a major change. Right now advertising agencies rarely have direct relations with manufacturing. TV broadcasters and media executives likewise rarely see the engineering process, or even think about trucking companies.

But in the very near future, the multi dimensional capabilities of the new media will create demand for very different services and very different organizations. We are likely to see demand for "media buying" that can open interactive links on internet like service that require both engineering and artistic skills. We are likely to see "push" promotion transformed into an interactive promotion in which customers are induced to buy cars by actually participating in their designs (one step toward the custom order car so often envisioned?)

Perhaps we will see the "unbundling" of the current advertising industry around some of their current core skills. For example, internet and kiosk experiments both show that the material you post for customers to see must be very entertaining, or they simply will not react to it. If they do not react to it, you don't capture their wishes or feelings. Therefore, the

behaviorally-tuned artistic skill resident in advertising agencies will almost certainly be enlisted to devise the "look and feel" of the new systems that will make customer contact.

Likewise, the "market research" functions have deep skills in creating questions that yield actionable results. While they will have to modify many of their assumptions, these skilled professionals will no doubt be called on to structure the functional software architecture . Why the software architecture and not just some survey forms? Because early analysis of internet use shows that the sequences that customers use to "flip through the pages" of the internet can be captured and are of great use in interpreting information about those customer's preferences. (For example, when presented with a digital mock up of a car interior and its optional features, which features do they select for elaboration first, second, third? Which ones do they return to?) Many of the creative focus group techniques can be ported to the net with a little creativity.

With these new functions will come new responsibilities. While there are a whole number of metrics used to track advertising effectiveness right now, in truth they are often pretty gross measures, with relatively indirect responsibility, compared to many factory functions for example.

Without too much imagination, *one can envision a near future in which "advertising" people must take direct and measurable cost responsibility for "order processing" and "factory scheduling" as "advertising" becomes more of a two-way facilitation industry.* Agencies will have to create "artistic assets" that provoke the right kind of consumer response to provide swift and credible data to the manufacturing system and the product development system. Before you dismiss this as too strange, consider the fact that trucking companies once were not responsible for distribution scheduling, but now some of them have taken over the entire logistics and stock management process for major producing companies. Likewise, companies that once only sold computers, now actually run the communications systems on an outsourced basis for many customers.

We are very likely to see the *complete transformation of the "dealer advertising" industry.* By most accounts, this runs to several hundred dollars per car, money that is probably much better used in new customer-seeking systems that really narrow down the targeting and sales process. Already local and national newspapers have moved into local internet web site production, although they seem not to recognize how to cheaply and effectively provide these services.

The broadcast industries, those that are on the right hand side of our strategic new media map will also have their work cut out for them. As new swift software on internet like networks increases, and as the forms of interactive cable increase, *it seems logical to conclude that industries that can only "push" messages will have to fight for competitive transformation.* It would be rash to speculate specific changes, but it seems assured that the current economic equation that supports the business will change. The distinction between advertising and content will certainly continue to change (more "infomercials"?), probably to a more sophisticated and targeted set of programming, while resting on a core of the broadest social media products.

The cable and telecom industries seem very well placed to be right smack in the middle of the auto new media revolution, because of their interactivity and versatility, and one should expect them to be receiving an increasingly large share of the financial value now passing through the advertising agency-broadcast TV partnership.

In short the media world will have a very interesting future as the auto and other industries re-configure their approach to markets.

LESSONS FROM THE MARKET: NEW MEDIA IMPLICATIONS

While the brave new world of electronic change and linked services seems confusing and disjointed at times, we can follow the lessons of history to help chart a course. Several core truths should stand out.

LESSON ONE: CUSTOMERS REALLY HOLD ALL THE STRATEGIC POWER

Customers like to do *what they want, when they want, and how they want.....and they will constantly push the edges of the envelope to preserve their freedoms and enhance their car owning experience.* Nobody forced people to buy VW Bugs. The 1976 Honda Accord did not spark a revolution because it reduced customer buying and use options; it did so by increasing customer choices, while simplifying deep cultural messages.

This market truth can have punishing effects on those who ignore the often subtle power of "information technologies". Give customers a slight crack in the dike--- an independent information source on car reliability, for example---and they will eventually provoke a flood of innovation, like the revolution in manufacturing quality control of the 1970's and 80's. Let customers spread word of mouth about an unwanted system like seat belt interlocks (mid 1970's), and they will rearrange the Congressional "safety" agenda. Let car buyers envision a safe child in a front end collision, and they will demand dual air bags. Let the informational image grow that a car accelerated unintentionally, and departing customers will bring a German franchise almost to its knees. Ignore the socially-transmitted image that all Japanese cars are inherently more economic and reliable than American cars, and customers will punish domestic market share.

On the other hand, those who can manage the customer drive for better car buying and driving and the attendant information

management tasks this requires, can take advantage of underlying customer power.

By creating an interactive tight link between its industrial systems and its dealer body, and by taking advantage of the many ways customers get and transmit information in a "culture", Saturn has become synonymous with "no haggle" buying.[39] By educating large segments of buyers to the advantages of leasing, several companies have revolutionized how "average" car buyers see the economics of buying new cars: new cars are no longer huge fixed investments to be afforded only every 6 or 7 years, they are quite affordable monthly payments and a fresh model every two or three years.

Much of the strategic positioning in the capital and technology intensive car business is about *power*: the power to amass large production systems, the power to stick with markets through tough times, the power to negotiate with the world's largest governments....and the power to maintain perhaps the largest single distribution system the world has ever known. In this environment it is too easy for powerful companies to loose sight of the ultimate power....*the power of hundreds of millions of customers* who throw around the weight of $1.5 trillion in car markets. It is precisely this consumer power that is enhanced by new electronic media.

New media enhance customer power *by increasing the volume, variety and credibility of information made available* to the millions of people participating in the market. "Ordinary" customers now have almost instant access to information beyond the dreams and control of dealers and factories.

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[39] This has implications perhaps far larger than GM ever expected. In Europe, which faces a distribution revolution as large as that in the States, "Saturn" has become a universal symbol among distribution executive across the whole industry. It has become an industrial icon of the future, and is likely to represent the industrial ideology of an entire continent, far beyond the realities of the actual Saturn system. This is the power of information transmitted across the Atlantic.

Because this information is not proffered by car companies or dealers, but by independent information agencies and car owners themselves, it has a high degree of credibility.

LESSON TWO: THE AUTOMOBILE IS AN INFORMATION INTENSIVE PRODUCT

If we were only seeing new forms of advertising emerging in the new media, the stakes would not be so high. *What are the attributes of the vehicle buying process that fit the latent advantages of the new media?*

Long and emotional buying process

Most people are almost constantly shopping for cars in their minds. Enthusiasts, of course, devour the auto press. But even people who think of cars as appliances often subtly compare their cars to others, wish for improvements as they spill coffee in their laps from hastily designed cupholders, wish they had been able to merge with freeway traffic more easily, hate getting stuck in the snow, and endure the bragging of the "Jones's" about their new car purchase.

If you suddenly offered 15 million half-price cars for sale in North America, you would probably provoke a flood of "new" buyers, who had really been readying themselves for a new purchase at some subconscious level, but who were waiting for the right time to part with $20,000, the approximate price of a new vehicle.

In addition, the process of deciding on a new vehicle is heavily invested with emotion. For most people the prospect of picking the wrong vehicle is a fundamental "fear" that drives them to seek a wealth of trusted information about prospective purchases. For one to settle in emotionally on the right car purchase, one must often digest not only advertising, and the thinly veiled promotional articles in popular press, but the more objective data from consumerist sources, the negative popular press (remember rollovers, side impact fires, and dirt in Japanese seat belt retainers?), the government (crash tests, fuel economy, interior volume, and now

"foreign" manufacturing content), and very importantly word-of-mouth from other car owners. Most of these data sources conflict with each other in some respect (auto press often praise vehicles that seem to get poor government crash tests, crash tests on similar models often seem to conflict), so the process of digesting all these sources is fraught with emotional content as customers sense which sources of information they should ultimately trust in making their decision.

Information intensive product

Adding to this complex emotional buying process is the fact that there is so much information to digest about cars. To make a decision one must absorb: styling content, performance (tens of variables), status image, repair records, safety (again multiple variables), price and method of financing, insurance cost, multi-season drivability, convenience of service, intangible comfort and "fit" features, and a host of other attributes conveyed by even a single vehicle.

And something new has been added to the information equation: how to buy the car. Customers now have many "channels" and purchasing options that add information to the buying process [40]. Most publicized has been "no haggle" buying. Some equate this with single price selling (a la Saturn), but many dealers differentiate themselves by reducing anxiety, even if they still negotiate prices. They will offer an immediate discount from sticker, even if they are willing to negotiate further. Many buyers don't really care about the last $100 of negotiation (the emotional price of dickering is too high), but they know from the culture that you're not supposed to buy a car at sticker price. By offering an immediate discount, the dealer eliminates this fundamental emotional block to the selling process, even if they are not part of the Saturn franchise. This means customers must seek information

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[40] Buying clubs, warehouse stores, association buying services, brokers, dealers who sell over the phone, internet listings, single brand dealers, auto malls, etc.

on the styles of dealers even within single brand chains.

Ultimately, the purchase (and use) of an auto is very information intensive, with, up to now, a high cost of getting enough trusted information. To the extent the customer is offered a wide scope of inexpensive information under his or her own control , the buying process is enhanced. Who does not want a better way to buy a car? What better way to learn about this than through a low-cost information seeking process that you controlled yourself?

Negotiated sale

The ultimate enforcer of the power of new media is the fact that the buying process is still largely a negotiated one, even in "no haggle" chains (where you might have to "discuss" trade in value of your car [41] or the financial options of ownership. This means that when it comes time to make the final cut, the party with the greatest amount of information is likely to control...or feel in control...of the situation.

This is crucial not only for customers, who hate to feel "taken, but for dealers and the entire car industry, whose credibility is placed on the line with every single negotiation.

Considering all the work steps in thousands of vehicle parts, about 20,000 people contribute some effort to every single car made. Their good efforts can be completely thwarted by the wrong attitude of a salesperson...or by a salesperson who does not know as much as the customer. In truth, millions•of labor hours each year rest upon the credibility of individual sales people, and if they do not know as much as their customer about the vehicle, or about competing vehicles, the credibility of the entire enterprise is affected in the mind of the customer. The efforts of 20,000 people who follow just-in-time manufacturing rules, are wasted if that car sits in a dealer lot because the salesperson could not meet customer

expectations, or if the customer has obtained new media information that conflicts with salesperson information[42].

Many executives who view retailing and distribution as "moving the iron" do not understand that industry power rests on this point-of-purchase fulcrum. Industry analysts often hear "this is a great car but customers don't understand it". Companies usually lose market share by creating unpopular designs, but they can also lose because they can't convey the true attributes of a vehicle in a trusted manner to a wide variety of customers who started their shopping long before showing up in the showroom for the anticipated, and often odious "negotiation" step of the buying process..

There are many examples where the objective measures of the product warrant increased sales, but where the trusted information bundle in the customer mind didn't cut through the negotiation process. The most publicized example was the Audi "sudden acceleration" image. More damaging perhaps is the American "poor quality" legacy: despite equal quality levels, many buyers still project a higher quality image onto any Japanese car. Likewise the objective quality improvement of many European vehicles is not reflected in greater retail transactions. Again, there are many factors at work here, but chief among them is the information credibility and diffusion among the millions of people who are constantly shopping for cars.

And the rubber meets the road in showroom negotiation. The company

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[41] In limited post-sale interviews, this is the one area where some Saturn buyers felt a little uncomfortable about the process.

[42] We witnessed many such interactions at dealers. In one notable instance the customer had correctly discovered a $1000 rebate through on-line sources, but the salesperson had not yet been informed of the incentive. The "pre-sold" customer left quickly in a huff when the salesperson stiffly argued there was no such incentive. In another transaction a dealer wasted more than one hour of selling time he spent with a family on a Sunday afternoon, because the family had identified a more advantageous corporate lease rate than the dealer could find in his reference books. In both these cases, the consequences could have been avoided if the dealer had the same information sources at his disposal that the customers had.

without pre-sale management, and an informed sales process, will lose the customer.

The negotiated sale process, laden with information and emotional content, requires that car makers and retailers manage complex information bundles, not just the engineering and price attributes of the vehicle. In 1957, the information meter usually started running at the point a customer stopped by the dealer to "kick the tires". An essential strategic point of the new media is that "electronic tire kicking" now starts well before the first dealer visit. The negotiated sales process mandates that consumers seek information before doing battle with dealers, and the new media systems require that dealers and car makers understand and manage a much broader pre-buying information network than they did even ten years ago.

LESSON THREE: THE FRANCHISE SYSTEM WILL REMAIN AT THE CORE OF THESE CHANGES

In simple terms all automotive distribution and retailing takes place through a legal agreement, the franchise contract between the factory and the dealer. Although it often produces complaints, the basic system is a good one that allows the factory some directional control over how its cars are sold, and allows local business people a robust way to link up with the vast production system. The franchise contract is a *basically successful* mechanism to link the retail portion of the value chain with the engineering and production part of the chain. In addition, there are literally tens of billions of dollars invested in the current franchise infrastructure, which creates a certain amount of inertia to radical change. Even if other distribution systems are much better, they must also generate tons of cash if they are to replace the investments made by many citizens in the current system.

Therefore, it is clear people will not soon be buying 15 million vehicles per year directly from the production lines "over the internet."

But it is equally clear that customers are constantly pushing the edges of the system to get things done in a better way, and new media will accelerate this.

Perhaps the best way to think of this is to stop thinking of the franchise system as a physical entity.... a group of stores legally attached to the factory. Instead it is useful to think of the franchise contract as a "security" that measures the strength of a factory's relationship with its customers...a legal instrument that has a market-defined value, much like a share of stock. If a company does not respond to market changes and produces a large number of undesirable cars, fewer people will want to sell these cars, and the value of the franchise contract with this maker declines. If a factory is doing a lot of things right, and its cars are in demand, the opposite effect pertains and the value of its franchise contracts increases. Likewise, if a dealer does not follow customer demand well, he reduces the value of his franchise contract, making it easier for a more market-tuned dealer to take over the relationship.

The point is that when one conceives of the franchise contract as a relationship between a car producer and the people buying its cars, and not as a physical network of stores, then one can see many new ways to maintain a strong strategic connection between customer and producer.....no matter how many ways that car can get ordered and into customer hands. Simply put, there is no difference between a franchisee who sells cars over the internet, or by phone, and one who sells cars through a typical storefront, as long as they are both meeting customer needs.

Too often, when some visionary postulates new electronic ways to sell cars it provokes a defensive reaction from traditional retailers and marketers who have much invested in the existing franchise image. In truth, the new electronically active markets are most likely to represent modern adaptations of the existing franchise concept, and are only a threat to organizations who do not perceive the benefits of electronic market enhancements.

THE FINAL LESSON: THE "OLD MEDIA" WERE "PUSH" STAND-ALONE MEDIA.... THE NEW MEDIA ARE "PULL" MEDIA WITH THE ABILITY TO INTERCONNECT WITH ALL PARTS OF THE AUTOMOTIVE DESIGN, PRODUCTION, AND SELLING SYSTEM

One of the keys to understanding the "new media" phenomenon is that it is really not new. The process of seeking information and shopping preparation is decades old and is the standard customer behavior.

The reason to be concerned about the power of the new media is precisely that it accelerates and enhances a tried and true customer driven process, it does not try to alter the tides of human behavior..

In this area, we must consider the linkage between three massive industries: the auto industry , the "advertising" industry, and the "media" industry. Owing to the size and information intensity of the auto business, these three giants have grown together. To date, this relationship has been little affected by the revolution that took place in global manufacturing, and the massive economic joint venture operates according to rules that are very similar to those of the 1960's ("let me tell you how great this car is").

But the new media trends will change this accord in very interesting ways. First, we know that customers like advertising, in its traditional form, just about as much as they like the current car retailing process. And with notable exceptions, advertising is probably just about as effective as the dialogue created by car salespeople. Both are actually effective, but both can benefit from successful changes.

A major dimension of new media technologies is that they bring, to the auto-advertising complex, tools for improvement that are just as powerful as "Japanese manufacturing techniques" were for the manufacturing end of the business.

It's hard to find an auto manufacturing or engineering job that hasn't been dramatically transformed over the past 15 years.

A similar technology-driven cultural shift is hitting the marketing, distribution and advertising side of the business (in fact this is happening well beyond automotive advertising). In simplistic terms, the traditional model was for the car company to come up with a very detailed "marketing and promotion" specification, translated to the advertising agency through the "account" manager process, converted to "output" by the "creative" (e.g. "manufacturing") part of the ad agency, then translated over to the "media buyer" who would get space on the right "pipes" (TV, magazines, billboards, matchbooks) to send the right message to the customer.

Rarely was this process linked directly to the physical dimensions of distribution, or to the "hard" processes of engineering and manufacturing.[43]

The magic of "Japanese manufacturing techniques" was that they required direct connection between previously unlinked functions: product engineering, process engineering, assembly manufacturing, supplier manufacturing, parts purchasing, parts logistics, finance, etc. The magic of the new media is that they will force connections between many of the unlinked "market facing" industry functions, the customer, and the "hard" parts of the business like manufacturing and logistics.

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[43] Of course there is all kinds of consultation among different functions in the system, but there are almost no direct and real time connections.

ROADSIGNS FOR INDUSTRY

This article has taken a long walk through a very complex subject. It is not possible to detail some of the more operational innovations that are emerging in this new media environment, and it is impossible to predict the future. But, there are some guiding "truths" that are already founded in enough actual business to be able to provide some roadsigns to the future of the auto system in light of new media changes.

First, just as the winning new global manufacturing strategy is based on some derivative of just-in-time, the new successful marketing strategies will exhibit a central theme. Companies will have to learn how to "give up control to get ultimate control".

With a Saturn-like style, but probably with many different actual methods, companies will have to devise market facing systems that listen, seek, move into customers' lives without intruding, and generally give up most of the "push" instincts that have been so long engrained in the industry. Customer facing "lip service" will not work. Strategies and methods will have to be credible at the customer level, or they will be ignored. It has been said so many times that it is cliched, but it is still true that a partnership with a customer is a much better economic deal than a pushy relationship. New media technologies allow forms of partnership only once dreamed of in the auto business.

Second, in order to accomplish the first, auto companies, dealers, advertising agencies, and others will have to expect large scale personnel changes, and completely new incentive and human relations systems.

Sales quotas will not work in a pull environment. Rewards must be set around satisfying and cost effective individual customer transactions. In the 1980's manufacturing metrics changed from "keep the line running at all cost" to "reduce hours per car while increasing quality beyond conceivable limits" In the

market facing portion of the industry the ideal metric will be the "hit rate".....an exact match between customer wishes and product configuration in the minimum time after production, with transactions costs approaching zero. This is easy to say, but it involves changing the instincts, incentives, training, and hiring of perhaps more than 500,000 people in North America. This wasn't easy in manufacturing, and it certainly won't be easy in post-factory businesses.

Third, the culture surrounding the dealer franchise agreement will have to be modified so that the form of business chosen by the dealer is not dictated by the factory, but is adapted to the local retail environment.

Again, lip service won't work here. The industry desperately needs more of the innovative retailers who already work in the industry, and who work in other retailing environments. With the right touches, young business and technological professionals may actually aspire to be car retailers, not a typical career path at most business schools today.

We have been constantly surprised in our field research at the innovation and diversity in the North American dealer base. The good news for the auto companies is that dealers have in some fashion, in some place, created almost any new form of retail enterprise that is possible, and they are leading the way in some of the new media areas (although most car dealer staff are currently not technologically adept-----a major industry shortcoming). This means that in some senses the car companies need only to follow the lead of successful dealer innovators, and then find ways to help spread successful methods throughout the market system. This will undoubtedly require cultural change in portions of the auto industry where the instinct is to try to control dealers. There is most certainly a balance point between the amount of control required for brand identity and good service, and explicit loosening of control to allow those closest to the market to follow customer leads.

Fourth, very courageous senior car company managers will have to work up the support and organizational means to be able to cancel major car programs, perhaps on a regular basis, if they do not sell well, and to plow the saved excess distribution costs into new market responsive car programs.

This has turned out to be one of the most important management skills in running complex electronics and technology companies, and the auto business is now truly a complex technology business, with shortening product cycles and powerful, shifting customers.

The instinct in most motor companies is to "ride out" a slow seller, trying to extract the greatest amount of cash recovery from the quite sizable sunk production assets. Unfortunately if the total system cost of this product generates excessive marketing costs, dealer ill-will, and unexciting customer response in the marketplace, the perceived cash extraction from manufacturing assets may be of little use.

Given that there really is no way to avoid a pull system in the post-assembly processes, especially with the advent of new media, some day, somewhere, some company will face the terrifying decision of dropping a $3 billion dollar investment in engineering, because the marketing costs will have exceeded the profit potential by a sufficient amount.[44] It will serve this company well to have the credible, transparent cost systems in place, firmly connected to real customer data, so it can make such decisions accurately and with broad organizational support.   •

Fifth, and related to four, auto companies will have to find ways to use new media pull systems to keep attacking industry system cost and overheads.

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[44] In truth many companies have already been forced to do this, but they did so in crisis, and without anticipatory systems that would have cushioned the impact. The effect on auto equities has often reflected this "financial drag" on the producing system.

Otherwise they will lose the global social competition for capital and talent. Automotive equities in real terms have been reduced significantly recent decades. Simply put, money gets better returns elsewhere, and in capital markets most auto companies are useful mainly for their cyclical play. One dimension of the new media explosion outside the auto industry is that it is becoming a significant form of attractive human endeavor, and it will consume both talent and capital that will place broad competitive pressures on the auto industry. If auto companies can keep cutting deadweight overheads, by attacking system inefficiencies in their post-assembly processes, and by linking customers directly to manufacturing and engineering processes, they will be able to remain a viable place to invest capital and talent.

Sixth, related to four and five, auto companies will have to use new media connections to the customers to solve some very tricky pending market segmentation challenges.

For decades the auto industry has been caught in a pincer of sorts. As volumes of individual models dropped in the marketplace, manufacturing and development costs have risen. This means companies either have to pick their segments very carefully, or find ways of stretching the brands they have to more customers. In either case, the new media will provide ways to help, and therefore will set new competitive standards among the car companies.

One pressing example is the "golden handcuffs" of the truck market. When you cut to the chase, most of the aggregate "automotive" profit of the past decade has been owed to the successful sale of light trucks to "ordinary" car customers. This is because trucks provided overwhelmingly positive features for consumers, that could not be found in cars. But in truth, at the technical level, most trucks are "overbuilt" for the average customer needs, and we are already seeing market "regression"

toward a middle ground between trucks and cars.[45]

Already companies are creating "hybrids" that blend the best features of trucks and cars. There is very likely to emerge a complex segmentation challenge in the large and profitable non-car segment of the market, and winning companies will be those who can read the very subtle signals from customers, and come up with the right "hybrids" at the right time, while continuing to invest the right amount in the "full truck" lines.

Other segmentation challenges are the "urban vehicle" and "zero emissions vehicle" questions. Still others relate to new imports from Europe and experiments with small run specialty cars.

The auto market never stands still, and it should be evident that companies with a finger directly in the "sensory pulse" of the market will have an advantage in capital investment and low-cost marketing.

Seventh, car companies will need new media systems to help them understand how best to drive the "electronification" of the motor car.

A whole array of electronic technologies can be integrated with the motor car to make it a more versatile participant in the social system: cellular phones, sound and environment systems, electronic vehicle systems, navigation systems, mobile office systems, and so on. The problem is it is very difficult and expensive to know how best to build these in ways that customers want. Some companies tried to build in captive cellular phone systems, in order to raise the value added (prices) in cars, just about the same time cellular companies began giving phones away for free.

Given that electronics can easily cost several thousand dollars in each car, it is crucially important for the auto industry to

understand how the motor car will fit in the larger emerging electronic systems environment. For the most part, most "car guys" [46] think like mechanical engineers. In the next century, dominant skills will be of electronic and software engineers.

Interpreting how the car should interact with the emerging new media environment will require using forms of the new media to get it right.

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[45] The van market is no longer an automatic high profit winner. Sport utility vehicles are showing signs of marginal market resistance. Global product development in "truck like objects" is increasing. Regulatory costs are likely to pressure margins over the next several market cycles.

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[46] Common industry vernacular. Not intended as a discriminatory comment.

CONCLUSION

We have come a long way since car platforms lasted for 8-15 years, since broadcast media controlled the viewing format of American consumers, since computers were the territory of a highly specialized elite who walked the refrigerated rooms of mainframes. From the 1950's we have had a relatively stable economic balance between the triumvirate of autos, advertising/media, and information technology. But seemingly overnight, long-growing trends have met in an arena now dominated by independence and experimentation. Social, economic, technical , and political boundaries cracked all at once, and we are entering a whole new period of development.

In short, we are moving into a new economic world driven by technologies none of us fully understands. That means we can't survey each other and ask what we want, because the answers will only reflect our current state of experimentation. Life is not as slow as it was before, and we change our minds with each new innovation. Therefore, the only systems that can keep us in touch with ourselves, are ones that interact and re-interpret constantly. This fact has just hit the auto industry in spades. It was changing rapidly already, but it now has the means and the mandate to make change a daily event.

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