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Automotive Industry Online

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Welcome to eMarketer

Dear Reader:

Welcome to eMarketer's coverage of the state of e-business in the automotive industry. eMarketer's *Automotive Industry Online*™ report examines how the internet is reshaping the ways in which vehicles are manufactured, marketed and sold to customers.

The report begins with an overview of the automotive industry and is subsequently broken down into six main sections, each of which looks at different e-business practices and the impact they have been having on firms along the automotive value chain, from original equipment manufacturers (OEMs) and parts suppliers to web-based content and e-commerce companies to dealers and consumer end-users:

- IT and e-business spending
- Online advertising
- Consumer-oriented websites and consumer usage preferences
- Automotive dealers and the internet
- Selling online to consumers
- In-vehicle information systems

With data aggregated from a broad range of research firms, government agencies and industry associations, including Allied Business Intelligence, the Center for Automotive Research, EDS, GartnerG2, Giga Information Group, Jupiter Research, J. D. Power and Associates, KPMG, META Group, the National Automobile Dealers Association, Nielsen Media Research, Nielsen//NetRatings AdRelevance, Taylor Nelson Sofres, Telematics Research Group and the US Census Bureau, eMarketer's *Automotive Industry Online*™ report provides automotive manufacturers, dealers and marketers with a sense of how their e-business strategies compare with those of their competitors. The report will also be of interest to those companies that work closely with the automotive industry, such as parts manufacturers, advertising agencies, consultants, logistics firms and technology vendors.

In addition, readers may wish to consult eMarketer's eStat Database, which contains thousands of additional statistics on virtually every aspect of the global automotive industry, in order to get the most complete picture of vehicle production and sales trends as well as consumer preferences in the leading automotive markets around the world.

If you have any questions or comments concerning eMarketer or any of the material in this report, please call, fax or e-mail us.

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Written by Noah Elkin

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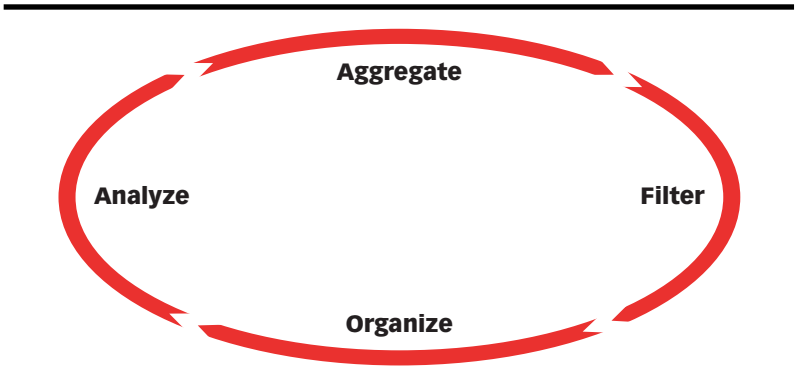
eMarketer's approach to market research is founded on a philosophy of aggregating data from as many different sources as possible. Why? Because there is no such thing as a perfect research study and no single research source can have all the answers. Moreover, a careful evaluation and weighting of multiple sources will inevitably yield a more accurate picture than any single source could possibly provide.

The eMarketer Difference

eMarketer does not conduct primary research. Neither a research firm nor a consultancy, eMarketer has no testing technique to defend, no research bias and no client contracts to protect.

eMarketer prepares each market report using a four-step process of aggregating, filtering, organizing and analyzing data from leading research sources worldwide.



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Using the internet and accessing a library of electronically-filed research reports and studies, the eMarketer research team first aggregates publicly available e-business data from hundreds of global research and consultancy firms. This comparative source information is then filtered and organized into tables, charts and graphs. Finally, eMarketer analysts provide concise and insightful analysis of the facts and figures along with their own estimates and projections. As a result, each set of findings reflects the collected wisdom of numerous research firms and industry analysts.

"I think eMarketer reports are extremely useful and set the highest standards for high quality, objective compilation of often wildly disparate sources of data. I rely on eMarketer's research reports as a solid and trusted source."

— Professor Donna L. Hoffman, Co-Director, eLab, Vanderbilt University

The Benefits of eMarketer's Aggregation Approach

Objective: information is more objective than that provided by any single research source

Comprehensive: gathered from the world's leading research firms, consultancies and news organizations

Authoritative: quoted in leading news publications, academic studies and government reports

All in one place: easy to locate, evaluate and compare

Readily accessible: so you can make quick, better-informed business decisions

Above the hype: accurate projections that business people can use with confidence

Time saving: there's no faster way to find internet and e-business stats, online or off

Money saving: more information, for less, than any other source in the world

"Benchmarking" and Projections

Until recently, anyone trying to determine which researcher was most accurate in predicting the future of any particular aspect of the internet did not have a definitive source with which to do this. For instance, over 10 firms predicted e-commerce revenues for the fourth quarter 1998 online holiday shopping season, and yet no single source could be identified after the fact as having the "correct" number. In the Spring of 1999, however, the US Commerce Department finally began measuring e-commerce B2C activity so business people and others could have a benchmark with which they could compare and evaluate projections.

eMarketer has adapted its methodology to recognize that certain government and other respected, impartial sources are beginning to provide reliable numbers that can be consistently tracked over time. Most of these established sources, however, only measure past results; typically, they do not make predictions.

Today, eMarketer formulates its Essential E-Business Numbers by first identifying the most established, reputable source for a given sector being measured and then adopting that organization's figures as *benchmarks* for the historical/current period. For instance, eMarketer's US internet user figures will be based on a combination of the most recent data from the US Census Bureau and the International Telecommunication Union. Using this data as the benchmark for 2000 and 2001, eMarketer will make projections for subsequent years based on the following factors:

- a comparative analysis of user growth rates compiled from other research firms
- additional benchmark data from internet rating firms, e.g., Nielsen//NetRatings, comScore Media Metrix, which use panels to measure internet user activity on a weekly and monthly basis
- an analysis of broader economic, cultural and technological trends in the US

Similarly, US e-commerce revenues are being "benchmarked" using historical data from the US Department of Commerce, and broadband household and penetration rate forecasts are being built off baseline data from the Organization for Economic Cooperation and Development (OECD).

Through this benchmarking process, eMarketer will be holding itself – and our projections – accountable.

"When I need the latest trends and stats on e-business, I turn to eMarketer. eMarketer cuts through the hype and turns an overabundance of data into concise information that is sound and dependable."

— Mark Selleck, Business Unit Executive, DISU e-business Solutions, IBM

A. Globalization, Consolidation and E-Business

In 2000, merger and acquisition (M&A) activity in the global automotive industry reached a fever pitch: 580 transactions valued at a total of $46.08 billion took place among original equipment manufacturers (OEMs), parts suppliers, aftermarket firms and automotive retailers and wholesalers. The spending sprees that characterized 2000 dropped off sharply in 2001 as the economy cooled around the world, with the overall deal value falling to $18.99 billion. In part, this was because 2001 saw fewer "mega-deals," such as General Motors' March 2000 move to take a 20% stake in Fiat Auto, which cost the US automaker $2.4 billion (General Motors subsequently wrote down the investment by nearly $2.2 billion to $220 million in 2002), and Ford's July 2000 purchase of Land Rover from the BMW Group for $2.7 billion.

Nevertheless, the result has been a growing consolidation in the automotive industry, leaving six principal manufacturing groups: General Motors (GM), Ford, DaimlerChrysler, Toyota, Volkswagen (VW) and Renault. According to PricewaterhouseCoopers (PwC), these six manufacturers account for more than 80% of total worldwide light vehicle production.

There are signs, however, that strategic alliances or joint ventures, which allow automakers, particularly smaller firms, to share the risk of developing new products. Examples include the GM-Toyota venture in building the Pontiac Vibe and Toyota Matrix crossover vehicles, and Porsche's recent collaboration with Volkswagen (VW) in developing its Cayenne sport-utility vehicle (SUV) (the corresponding VW model is the Touareg). Among the 110 automotive industry executives interviewed in North America and Europe in November 2002 by global consultancy KPMG as part of its "Automotive Industry Survey 2003" (80 of whom worked for suppliers and 30 for vehicle manufacturers), 72% believed that joint ventures will become a more important strategy for automotive firms than mergers and/or acquisitions (down from 83% in the previous year's survey), especially given the trend toward outsourcing greater portions of vehicle sub-assembly modules to suppliers.

Value of Merger and Acquisition Activity in the Worldwide Automotive Industry, 2000 & 2001 (in billions)

Note: includes vehicle and component manufacturers, automotive retailers, aftermarket and rental/leasing firms and wholesalers
Source: PricewaterhouseCoopers (PwC), February 2002

Even as M&A activity cedes ground to joint ventures in the OEM sector, the supplier sector remains in a consolidation phase, one that is expected to continue unabated through the end of the decade. PwC predicts that the number of Tier One suppliers will drop from roughly 800 in 2001 to a mere 35 in 2010. In the same timeframe, the Tier Two parts supplier population will plummet from approximately 10,000 to just 800. Note that the table below reflects only those transactions whose details and value were disclosed.

Top 10 Automotive Parts Suppliers, Ranked by Value of Transactions Closed, 2000 & 2001

Deal value (in millions)	Date	Target	Target nationality	Buyer	Buyer nationality	% acquired
2000						
$9,240	April	Actecs Mannesmann	Germany	Siemens/ Bosch JV	Germany	100%
$2,700	December	TI Group PLC	UK	Smiths Industries PLC	UK	100%
$2,169	June	Visteon Corp.	US	Shareholders	US	100%
$2,133	November	Masco-Tech Inc.	US	Heartland Industrial Partners	US	100%
$1,970	September	Mark IV Industries	US	BC Partners (Int.)	UK	100%
$871	January	TRW Lucas Diesel Systems	US	Delphi Corp.	US	100%
$589	July	Arvin Industries	US	Meritor Automotive Inc.	US	100%
$584	June	BBA Group PLC (Auto Friction)	UK	HSBC Holding PLC	UK	100%
$581	October	Detroit Diesel	US	Daimler-Chrysler AG	Germany	79%
$446	January	Mando Machinery-Auto	South Korea	Chase & UBS Capital Partners	US/China	100%
2001						
$1,526	July	Degussa Metal Catalysts (MMC2)	Germany	OM Group Inc.	US	100%

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$1,393	December	Textron Auto Trim Division	US	Collins & Aikman/ Heartland	US	100%
$1,353	June	TI Automotive Ltd.	UK	Shareholders of Smiths Group PLC	UK	100%
$1,223	March	Sommer Allibert	France	Faurecia	France	100%
$861	October	FAG Kugelfischer Georg Schaefr	Germany	INA Holding Schaeffler KG	Germany	87%
$449	March	Magenti Marelli Thermal Systems Division	Italy	Denso Corp.	Japan	100%
$435	October	Sagem Automotive Division	France	Johnson Controls Inc.	US	100%
$370	April	Temic Telefunken GmbH	Germany	Continental AG	Germany	60%
$300	March	Eaton Corp.-Switches/ Electronics Division	US	Delphi Corp.	US	100%
$260	February	Collins & Aikman	US	Heartland Industrial Partners	US	60%

Source: PricewaterhouseCoopers (PwC), July 2002

A survey conducted in 2001 by the non-profit Center for Automotive Research (now a division of Altarum), which included a representative sample of the 46 Tier One suppliers with the highest North American sales, produced similarly pessimistic results. The 16 firms that responded to the survey had total 2000 sales of $70.2 billion, and on average, each firm administered a supply chain of 1,303 suppliers). Of this sample, 77% responded that they would decrease the number of suppliers in their network by 21% within 12 months.

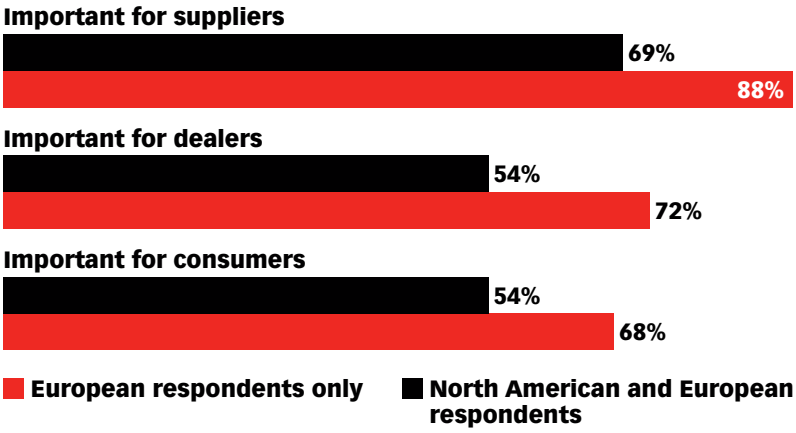
"The objective is to be viewed as a strategic partner rather than a supplier pushing components. By combining products that are already supplied as individual parts into a more highly integrated module suppliers have the ability to outpace the competition. To do this they must have an e-enabled technology infrastructure."

– Stephen D'Arcy, global automotive leader, PricewaterhouseCoopers (PwC), 23 July 2002

Dire predictions about what the future holds for parts suppliers are not so surprising when the excess of parts (and new vehicles, for that matter) across the automotive value chain is taken into consideration. According to the Aberdeen Group, the value chain – with as much as 80% of new vehicle components sourced from outside vendors – is presently congested by a $120 billion surplus of parts and vehicles.

As globalization sweeps through the automotive industry, with parts sourced from countries around the world and multiple versions of the same car assembled at different locations, the efficiencies that e-business can offer will become increasingly important to manufacturers at all points along the value chain. According to the KPMG survey, industry executives believe that the true value of the internet lies in conducting business with suppliers.

North American and European Automotive Executives' Expectations of the Impact of E-Commerce on Relationships with Suppliers, Dealers and Consumers, November 2002 (as a % of respondents)



Note: n=100 automotive executives (75 based in North America and 25 based in Europe)
Source: KPMG, January 2003

In any case, automakers and their suppliers will need to get their supply chains under control, especially given that by all signs, the trend is toward outsourcing greater and greater portions of vehicle manufacturing.

"By 2020, successful automakers will outsource most manufacturing and become fabless vehicle brand owners."

– GartnerG2, April 2002

GartnerG2 estimates that if the leading five auto manufacturers had eliminated overcapacities in 2001 and directed just 50% of the cost savings toward new vehicle development, they could have developed an average of 15 new models (assuming that new vehicle development costs average between $800 million and $1 billion). New models, of course, might contribute to the problem of overproduction and market saturation, particularly in the North American and European markets. Consequently, automakers must find a balance between excess production and putting out new models that will appeal to and satisfy consumer desires. Given the relative fickleness of consumers these days – 48% would consider another brand when shopping for a new car, according to GartnerG2 – automakers must keep ahead of, or better yet, learn to drive consumer needs and wants in order to maintain their revenue streams. Certainly it is no accident that US manufacturers have lost a lot of ground to foreign brands in the last 15 years, and the trend is not likely to be dramatically reversed until they can offer quality products that satisfy consumer requirements and provide wish-fulfillment where brand identity is concerned.

B. Production and Sales Trends

Following a decline in 2002, global light vehicle production (passenger cars and light trucks) should see a slight uptick in 2003, according to Michigan-based industry forecaster CSM Worldwide. However, the rebound, such as it is, will not extend to all regions. North America, heavily dominated by the US market, will see a small decline in 2003 (after a rebate-led sales resurgence in 2002). It will not see year 2000 production levels until well into the second half of the decade.

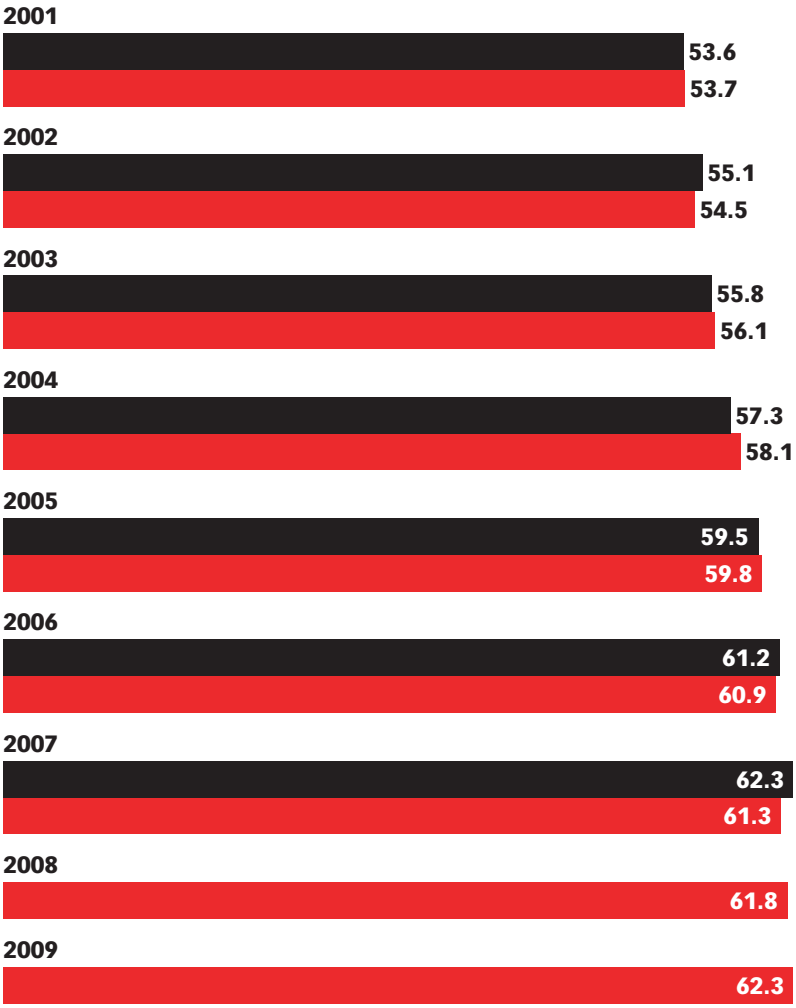
Worldwide Light Vehicle Production, by Region, 2001-2007 (in millions)

	2001	2002	2003	2004	2005	2006	2007
North America	15.5	16.4	16.1	16.2	16.7	17.0	17.1
Europe	19.2	18.6	19.0	19.8	20.5	21.0	21.4
Japan/Korea	12.0	12.5	12.5	12.4	12.6	12.7	12.8
South America	2.1	2.0	2.2	2.3	2.5	2.6	2.8
Emerging markets*	4.8	5.6	6.0	6.6	7.2	7.7	8.2
Worldwide total	**53.6**	**55.1**	**55.8**	**57.3**	**59.5**	**61.2**	**62.2**

*Note: numbers may not add up to total due to rounding; *includes Australia, China, India, Indonesia, Malaysia, Philippines, South Africa, Taiwan, Thailand*
Source: CSM Worldwide, November 2002

CSM's global forecasts coincide closely with those from AUTOFACTS, a division of PricewaterhouseCoopers.

Comparative Estimates: Worldwide Light Vehicle Production, 2001-2009 (in millions)

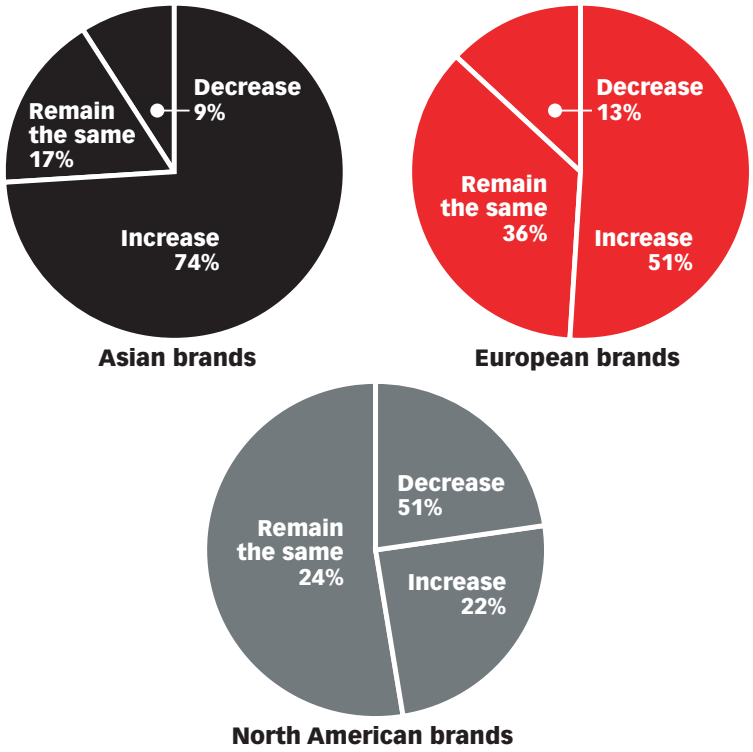


Source: various, as noted, 2002

Several factors will drive the global automotive market over the next five to seven years. The first is the waning brand loyalty of consumers – a disturbing trend from automotive manufacturers' point of view. Awash in a confusing sea of marketing messages, consumers are more likely than ever to switch brands in an effort to find the best possible deal. Second, with analysts expecting most North American and European markets to remain saturated for the foreseeable future, the executives surveyed by KPMG pointed to Asia (and Asian brands) as the engine of growth, as seen in the chart below.

Note that this data is drawn from the first KPMG automotive survey, which was conducted in the fall of 2001. Preliminary data from the second survey indicates that the 2002 figures were largely unchanged.

Expectations of Shifts in Global Market Share of Automotive Brands over Next Five Years among North American and European Automotive Executives, November 2001 (as a % of respondents)



Note: n=113 automobile manufacturer and supplier executives
Source: KPMG, November 2001

An additional factor is the growing appeal of vehicles beyond traditional cars. In the North American market, 88% of executives surveyed by KPMG anticipate that crossover vehicles will see sales gains over the next five years. Expectations for sport-utility vehicles (SUVs) and light trucks, which have been the object of increasing criticism for their inflated gasoline consumption and problematic safety records, were divided evenly among those who predict sales will increase and those who foresee declines. There was more unanimity about the future of minivans, with 91% of those surveyed predicting a drop, or, at best, a plateau in sales over the next five years.

"We caused the American consumers to become very fickle and we have forced them to go where the best deal is, and that's unfortunate."

– Auto industry executive, as quoted in KPMG's "Automotive Industry Survey 2002"

US

Although the US experienced a mild recession in 2001, automobile manufacturers saw vehicle sales soar to their second-highest level in history, with consumers spending $243 billion on new cars and light trucks, according to estimates from the US Department of Commerce's Bureau of Economic Analysis (BEA). Even in 2002, as the recession deepened, vehicle manufacturers posted their fourth-highest sales results. On the surface, this might be considered news worth celebrating. However, a deeper look at the sales figures reveals that the historic heights the industry achieved in 1999-2001 – a period described by PwC AUTOFACTS as an "era of profitless prosperity" – were spurred largely by incentives. Rebates totaled an estimated $40 billion in 2002 alone.

In other words, consumers were more than happy to buy vehicles as long as the manufacturers paid them to do so, even in spite a weakening economy in 2001. In the short run, this might be a sustainable (if questionable) strategy, but it is clearly not tenable over the long haul.

US Vehicle Sales, by Vehicle Type, 2001 & 2002 (in millions and as a % change vs. prior year)

	2001	2002	% change
Cars	8.43	8.11	-4%
Trucks	8.70	8.70	–
Total	**17.13**	**16.82**	**-2%**

Note: numbers may not add to total due to rounding
Source: company reports, January 2003

Moreover, US manufacturers have remained overly reliant on sales of light trucks, including sport-utility vehicles and minivans (11 of the top 20 vehicles in 2002 fall into the light truck category, as the chart below demonstrates), feeding on the high margins these vehicles enjoy at the expense of loss-leading passenger cars. BEA calculations suggest that light truck profits can top $10,000 per vehicle, while each passenger car sold typically yields less than $1,000, and profits can dip lower when incentives are subtracted.

Traditional US automakers (i.e. those producing vehicles in the US, Canada and Mexico for sale in the US) should be wary of complacency. Each year, foreign manufacturers introduce highly competitive offerings, some of which are even assembled in the US, and these have been slowly but steadily chipping away at the Big Three's dominance over light trucks. With more flexible production, better utilization and sharing of platforms and shorter product cycles, non-US manufacturers that have domestic assembly operations, such as BMW, Honda, Nissan and Toyota (further complicating the issue of what constitutes a "foreign" car), are less vulnerable to economic shifts and better positioned to respond to changing consumer demands. Expect them to keep up the challenge, particularly in targeting the light truck segment, the Big Three's last bastion of profitability.

"The fact that we *aren't* experiencing a sharper downturn may allow the status quo to continue."

– Christopher Benko, managing director, PricewaterhouseCoopers AUTOFACTS, in executive briefing to Association for Corporate Growth, 12 March 2002

According to figures released by the automakers in early January 2003, the top two selling vehicles – light trucks from Ford and GM, respectively – held their positions in 2002. New versions of the Toyota Camry and Dodge Ram pickup helped to buoy sales of these vehicles. However, expect a shift in the rankings over the course of 2003, as the new Honda Accord, launched in late 2002 and a perennial competitor of the Camry, achieves full market penetration. It should also be noted that manufacturers like Honda and Toyota managed to achieve high sales volumes while offering significantly lower incentives than traditional US automakers.

Top 20 Selling Vehicles in the US, December 2001 & December 2002

	December 2001	December 2002	2001 Rank	% change
1. Ford F-Series pickup	911,597	813,701	1	-10.7%
2. Chevy Silverado-C/K pickup	716,051	652,646	2	-8.9%
3. Toyota Camry	390,449	434,145	5	+11.2%
4. Ford Explorer	415,921	433,847	3	+4.3%
5. Honda Accord	414,718	398,980	4	-3.8%
6. Dodge Ram pickup	344,538	396,934	7	+15.2%
7. Ford Taurus	353,560	332,690	6	-5.9%
8. Honda Civic	331,780	313,159	8	-5.6%
9. Toyota Corolla/Matrix	245,023	254,360	11	+3.8%
10. Chevy TrailBlazer	115,103	249,568	–	+116.8%
11. Dodge Caravan	242,036	244,911	12	+1.2%
12. Ford Focus	264,414	243,199	10	-8.0%
13. Chevrolet Cavalier	233,298	238,225	13	+2.1%
14. Ford Ranger pickup	272,460	226,094	9	-17.0%
15. Jeep Grand Cherokee	223,612	224,233	14	+0.3%
16. Chevrolet Tahoe	202,319	209,767	17	+3.7%
17. GMC Sierra pickup	210,154	202,045	15	-3.9%
18. Nissan Altima	148,345	201,822	–	+36.0%
19. Chevrolet Impala	208,395	198,918	16	-4.5%
20. Jeep Liberty	88,485	171,212	–	+93.5%

Source: company data, January 2003

"Everyone used to say that the light at the end of the tunnel for incentives was new products. But we're even seeing incentives on new models. Right now, the light at the end of the tunnel appears to be an oncoming train."

– J Ferron, analyst, PricewaterhouseCoopers, as quoted in AP, 7 January 2003

Despite having many vehicles in the top 20, overall, the Big Three had less reason to cheer in 2002. Full-year vehicle sales dropped for all of them, with Ford's down by 9.6%. Propelled to some degree by light truck sales, BMW, Honda, Hyundai, Kia, Mercedes, Mitsubishi and Toyota were among the foreign manufacturers that posted record US sales in 2002 (again, bear in mind that some of the "foreign" cars sold in the US were actually assembled here).

Note that in the charts below, the sales figures for the Big Three automakers do not include US sales of their European brands (Mercedes-Benz for DaimlerChrysler; Jaguar, Land Rover and Volvo for Ford; and Saab for GM). These have been calculated and broken out separately by the manufacturers. Note also that many of the Big Three's vehicles were actually assembled in Canada or Mexico, but these are nonetheless considered "domestic" cars for reporting purposes.

US Vehicle Sales, by Manufacturer, 2001 & 2002 (in millions and as a % change vs. prior year)

	2001	2002	% change
General Motors	4.83	4.78	-0.9%
Ford	3.76	3.40	-9.6
DiamlerChrysler	2.27	2.21	-3.0%
Toyota	1.74	1.76	0.9%
Honda	1.21	1.25	3.3%
Nissan	0.70	0.74	5.1%
Mitsubishi	0.32	0.35	7.0%
Volkswagen	0.36	0.34	-4.9%
BMW	0.21	0.26	20.4
Mazda	0.27	0.26	-4.2%
Hyundai	0.24	0.25	8.3%
Kia	0.22	0.24	6.1%
Mercedes-Benz	0.21	0.21	3.2%
Subaru	0.19	0.18	-3.2%
Volvo	0.13	0.11	-12.0%
Audi	0.08	0.09	2.9%
Suzuki	0.06	0.07	4.9%
Jaguar	0.04	0.06	37.4%
Isuzu	0.08	0.05	-35.7%
Saab	0.04	0.04	0.7%
Land Rover	0.03	0.04	50.7%
Porsche	0.02	0.02	-7.5%
Daewoo	0.05	0.02	-53.9%

Note: excludes sales data from Ferrari Maserati, whose sales for 2002 totaled less than 2,000 units
Source: company reports, January 2003

US Vehicle Sales, by Region, 2001 & 2002 (in millions and as a % change vs. prior year)

	2001	2002	% change 2001-2002
Asian vehicles	5.15	5.26	2%
Big Three vehicles	10.86	10.39	-4%
European vehicles	1.12	1.17	4%
Total vehicles	**17.13**	**16.82**	**-2%**

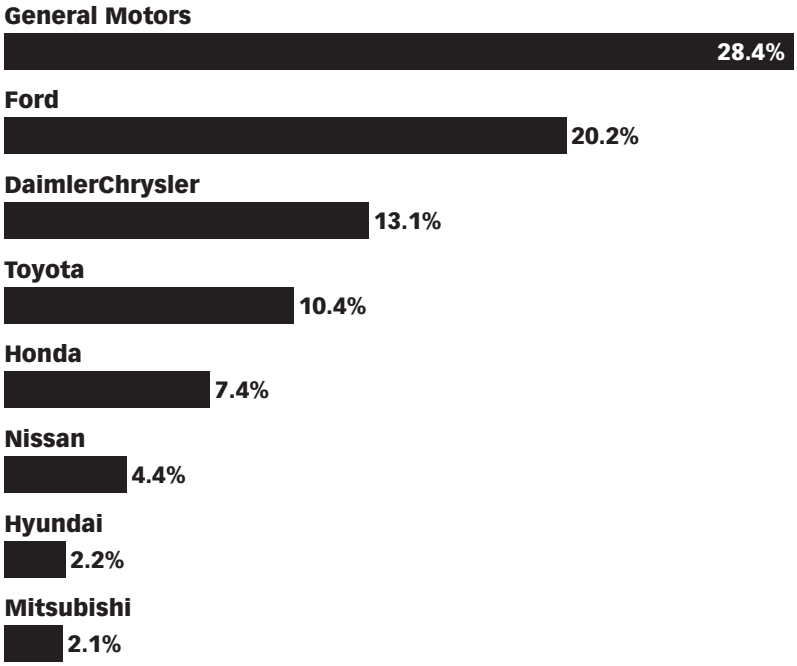
Source: company reports, January 2003

"Of course, we cannot sell cars without incentives, and nobody intends to do that. The question is the level and the speed of increase."

– Dieter Zetsche, chief executive officer, DaimlerChrysler AG's Chrysler Group, as quoted in AP, 7 January 2003

Traditional domestic manufacturers succeeded in taking back some market share in 2002 and overall, they still retain over 60% of the market. However, it is questionable if they will be able to sustain the rebate-led momentum, particularly as foreign manufacturers take the battle to the most hotly contested market segments.

Auto Manufacturer Market Share in the US, 2002



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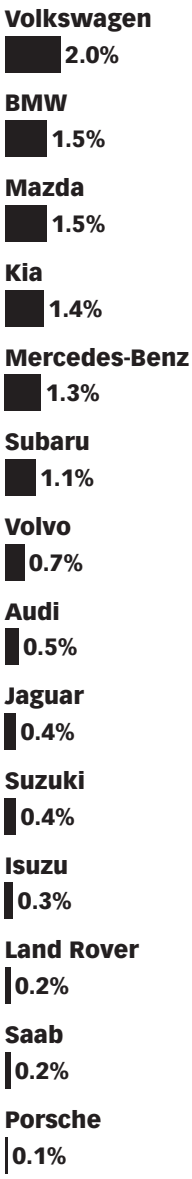


Source: company reports, January 2003

Europe

The European Union (EU) faces a distinct set of issues with the advent of new Block Exemption rules, which went into effect on 1 October 2002. The changes were designed to create a single, EU-wide automotive market (including new car sales, parts and service) and promote greater competition, in effect by deregulating the dealer franchise system. Other provisions loosened regulations on direct, internet-based auto sales and allowed for the creation of new automotive retail channels, such as supermarkets. It is too early yet to determine the effects of the changes, but as noted in Chapter V, dealers, among other participants in the automotive value chain, did not foresee a drop in business as a result.

Preliminary figures released by the European Automobile Manufacturers Association (ACEA) indicate that 2002 new-car registrations are likely to come in slightly lower than 2001. As of the publication of this report, data for 2002 was only available for first 11 months. Sales were down considerably in most of the major markets with the exception of the UK.

New Passenger Car Registrations in Western Europe, by Country, 2001 & 2002

	January-November 2001	January-November 2002	% change
Austria	281,873	266,687	-5.4%
Belgium	467,478	449,418	-3.9%
Denmark	88,305	102,541	16.1%
Finland	104,291	112,129	7.5%
France	2,094,485	1,985,698	-5.2%
Germany	3,115,544	3,025,838	-2.9%
Greece	267,736	255,836	-4.4%
Ireland	163,839	154,597	-5.6%
Italy	2,282,347	2,072,300	-9.2%
Luxembourg	40,812	41,551	1.8%
Netherlands	521,569	490,331	-6.0%
Portugal	237,506	212,962	-10.3%
Spain	1,318,566	1,217,344	-7.7%
Sweden	224,908	233,602	3.9%
UK	2,332,298	2,419,055	3.7%
European Union	**13,541,557**	**13,039,889**	**-3.7%**
Iceland	6,973	6,581	-5.6%
Norway	86,094	83,399	-3.1%
Switzerland	296,688	274,447	-7.5%
EFTA	**389,755**	**364,427**	**-6.5%**
Total Western Europe	**13,931,312**	**13,404,316**	**-3.8%**

Source: European Automobile Manufacturers Association, December 2002

The VW Group saw a slight drop in market share, although it retained the number one position. The main beneficiaries of VW's decline were the PSA Group, the parent company of Peugeot and Citroen, and the Japanese automakers. The ailing Fiat Group of Italy, plagued by financial woes, saw the steepest drop in market share as new products failed to find favor in the marketplace.

New Passenger Car Registrations in Western Europe, by Manufacturer, 2001 & 2002

	January-November 2001	January-November 2002	% change	Market share 2001	Market share 2002
VW Group	**2,627,823**	**2,468,998**	**-6.0%**	**18.9%**	**18.4%**
Volkswagen	1,508,831	1,385,215	-8.2%	10.8%	10.3%
Audi	507,682	514,366	1.3%	3.6%	3.8%
Seat	380,923	349,424	-8.3%	2.7%	2.6%
Skoda	230,387	219,993	-4.5%	1.7%	1.6%
PSA Group	**2,003,700**	**2,017,403**	**0.7%**	**14.4%**	**15.1%**
Peugeot	1,195,249	1,193,686	-0.1%	8.6%	8.9%
Citroen	808,451	823,717	1.9%	5.8%	6.1%
JAPANESE	**1,451,437**	**1,538,724**	**6.0%**	**10.4%**	**11.5%**
Toyota & Lexus	517,413	588,508	13.7%	3.7%	4.4%
Nissan	343,498	327,478	-4.7%	2.5%	2.4%
Mitsubishi	122,239	113,014	-7.5%	0.9%	0.8%
Mazda	129,263	145,956	12.9%	0.9%	1.1%
Honda	147,803	171,780	16.2%	1.1%	1.3%
Suzuki	131,133	136,767	4.3%	0.9%	1.0%
Others	60,088	55,221	-8.1%	0.4%	0.4%
FORD Group	**1,554,738**	**1,524,121**	**-2.0%**	**11.2%**	**11.4%**
Ford	1,236,348	1,194,802	-3.4%	8.9%	8.9%
Volvo	208,947	213,081	2.0%	1.5%	1.6%
Land Rover	70,782	68,254	-3.6%	0.5%	0.5%
Jaguar	38,661	47,984	24.1%	0.3%	0.4%
RENAULT	**1,478,974**	**1,430,231**	**-3.3%**	**10.6%**	**10.7%**
GM Group	**1,506,121**	**1,331,821**	**-11.6%**	**10.8%**	**9.9%**
Opel/Vauxhall	1,430,609	1,259,713	-11.9%	10.3%	9.4%
Saab	67,561	65,327	-3.3%	0.5%	0.5%
Others	7,951	6,781	-14.7%	0.1%	0.1%
FIAT Group	**1,341,805**	**1,093,084**	**-18.5%**	**9.6%**	**8.2%**
Fiat	1,006,410	829,511	-17.6%	7.2%	6.2%
Lancia	140,689	101,191	-28.1%	1.0%	0.8%
Alfa Romeo	191,199	158,472	-17.1%	1.4%	1.2%
Others	3,507	3,910	11.5%	0.0%	0.0%

continued on page 28

Daimler Chrysler	**884,912**	**887,369**	**0.3%**	**6.4%**	**6.6%**
Mercedes-Benz	695,084	696,703	0.2%	5.0%	5.2%
Smart	96,488	102,203	5.9%	0.7%	0.8%
Chrysler	92,901	96,818	4.2%	0.7%	0.7%
BMW Group	**505,643**	**580,203**	**14.7%**	**3.6%**	**4.3%**
BMW	486,010	482,274	-0.8%	3.5%	3.6%
Mini	19,633	97,929	398.8%	0.1%	0.7%
KOREAN	**385,922**	**358,026**	**-7.2%**	**2.8%**	**2.7%**
Hyundai	205,749	208,324	1.3%	1.5%	1.6%
Others	180,173	149,702	-16.9%	1.3%	1.1%
MG ROVER Group	**148,369**	**130,530**	**-12.0%**	**1.1%**	**1.0%**
Total for all brands	**13,931,312**	**13,404,316**	**-3.8%**	**100.0%**	**100.0%**

Note: The total for all brands represents an European Automobile Manufacturers Association estimate
Source: European Automobile Manufacturers Association, December 2002

Asia-Pacific

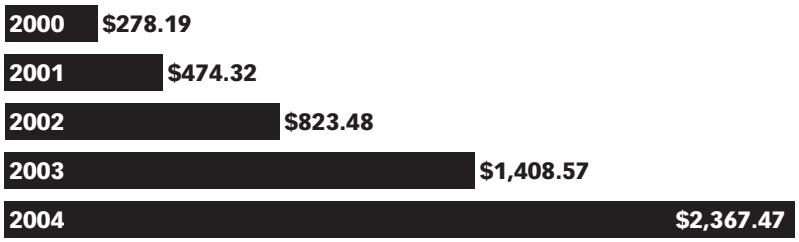
Only preliminary figures were available for the leading Asia-Pacific markets at the time of publication. In Japan, the Japanese Automobile Manufacturers Association (JAMA) indicated that full-year 2002 sales would drop by 2.3%, falling to 3.97 million vehicles. JAMA predicted a 1% in increase in 2003, pushing Japan back to the 4.0 million mark. Honda, Suzuki and Nissan were the only manufacturers to see gains in sales in 2002, at 7.0%, 3.0% and 0.7%, respectively.

The news from South Korea was more positive, with automakers reporting a 5.4% surge in sales in 2002, reaching a record 3.42 million units. The big gainers were Renault Samsung Motors, whose sales ballooned 65.4% in 2002; Ssangyong Motors, which saw an increase of 27.6%; and Hyundai, whose domestic sales and exports rose by 8.9% and 10.8%, respectively.

A. Introduction

Worldwide business-to-business (B2B) e-commerce is projected to reach nearly $2.4 trillion by 2004. Businesses in the US alone will account for 43% of that total.

Worldwide B2B E-Commerce Revenues, 2000-2004 (in billions)



Source: eMarketer, 2002

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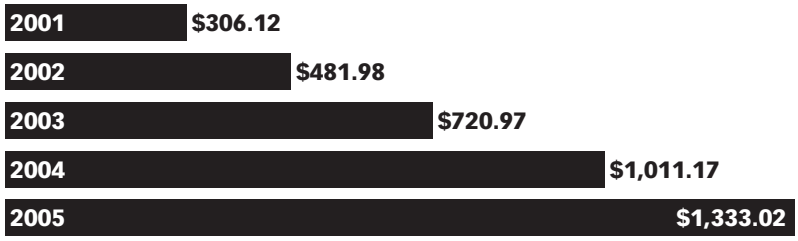
eMarketer expects the automotive industry to make a significant contribution to the volume of internet-based trade in the US. The motor vehicle and parts industry is forecast to generate $274 million in revenues from online trade by 2004, according to eMarketer calculations, making it by far the largest industry on the internet and giving it a significant 27% share of B2B e-commerce in the US.

US B2B E-Commerce Revenues, 2001-2005 (in billions)



Source: eMarketer, February 2002

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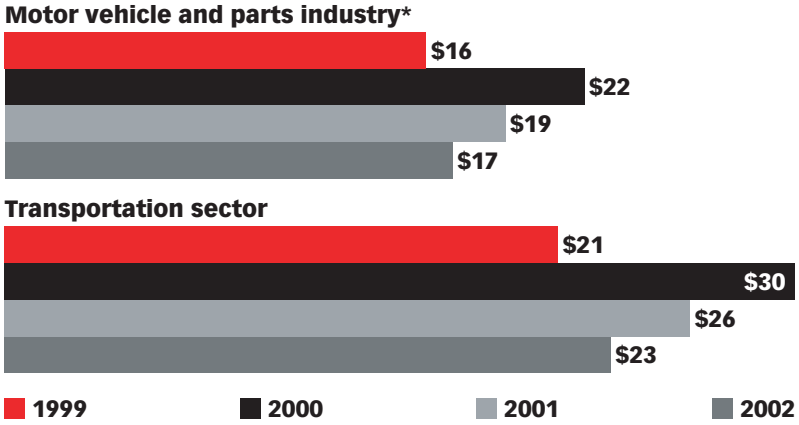
Automobile OEMs as well as parts suppliers have stolen a considerable march over other US industries where the internet is concerned. Over the next several years, this commitment to internet-based trade and e-business collaboration should help automakers save money and streamline production, but it is questionable whether the application of new technologies will help them recoup market share lost to European and Japanese manufacturers. Greater sensitivity to consumer preferences, quality and reliability concerns and design questions are more likely to have a tangible effect in that corner of the marketplace.

B. IT Spending and Strategy

According to the 1997 US Economic Census – the most recent such government survey available – sales for the motor vehicle and parts industry, a component of transportation equipment manufacturing (NAICS code 336 – itself a subsector of manufacturing [NAICS code 31-33]) – totaled $424 billion. This figure represents 74.1% of total sales in the transportation sector. It also provides a rough guide to the weight of the automotive industry in the transportation sector as far as IT budgeting and spending are concerned. In the section below, the 74.1% figure will be applied to more recent manufacturing data produced by market research firms such as the Giga Information Group and META Group in order to provide the reader with an approximation of IT budgeting and spending trends in the automotive industry.

The Giga Information Group estimates that IT spending in the US totaled $779 billion by year-end 2002. The transportation sector accounted for $23 billion, or 3.0% of the total. Employing the assumption noted above, i.e. that the motor vehicle and parts industry constitutes 74.1% of the transportation sector, results in an estimate of $17 billion in IT spending for the automotive industry in 2002.

IT Spending in the US Transportation Sector and Motor Vehicle and Parts Industry, 1999-2002 (in billions)



*Note: *Represents an approximation based on the assumption that the motor vehicle and parts industry constitutes 74.1% of the transportation sector, a figure derived from1997 US Economic Census data*
Source: Giga Information Group, December 2001

 www.eMarketer.com

While IT spending across all US industries was forecast to post a modest increase in 2002, rising from $750 billion to $779 billion, the transportation sector was poised for a moderate decline in IT spending, off $3 billion from $26 billion in 2001, according to Giga Information Group calculations. The $23 billion figure for 2002 represents a drop from a high of $30 billion that the transportation sector budgeted for IT equipment and services in 2000.

"Of particular importance for players in the high-tech and automotive space is the ability to achieve real-time visibility across the extended value chain. Speed of reaction is now vital, and visibility of the supply chain together with a clear view of customer demands is strategically important."

– Jennifer Thompson, senior research analyst, IDC, 5 September 20027

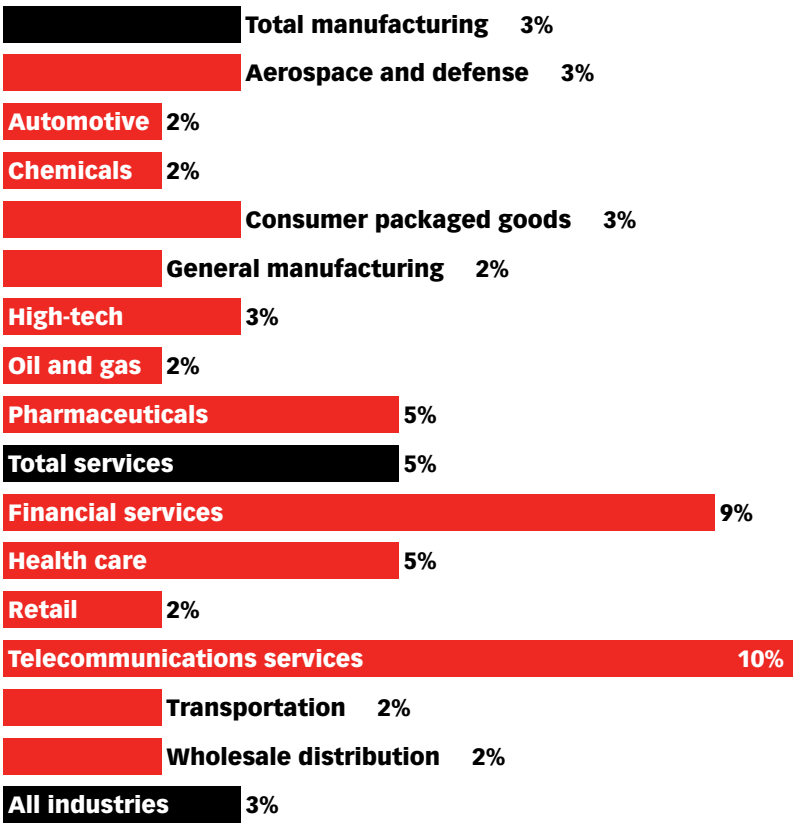
In a study of the 22 top motor vehicle and parts manufacturers – a component of the *InformationWeek* 500 – *InformationWeek* magazine found that these industry leaders were spending an average 2.0% of their company revenues on IT in 2002, unchanged from 2001. It is important to note, however, that these firms are considered technology leaders within their industry and are likely to spend more on IT than a representative sample of their industry as a whole.

Average Portion of Automotive Company Revenues Spent on IT, 2001 & 2002

Note: n=22
Source: InformationWeek, September 2002

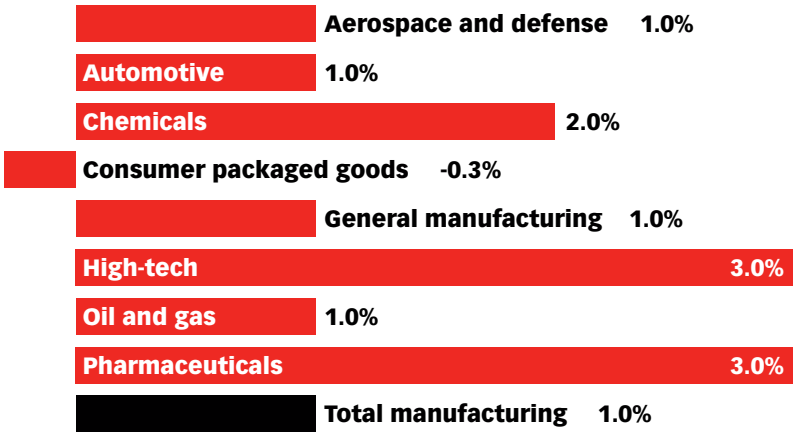
AMR Research also estimated that companies in the automotive industry spent an average of 2.0% of their revenues on IT in 2002, with that number predicted to rise by 1.0% to a total of 3.0% in 2003.

US IT Spending, by Industry, 2002 (as a % of company revenues)



Note: n=500
Source: AMR Research, July 2002

Average Anticipated Change in US IT Spending, by Industry, 2003



Source: AMR Research, July 2002

By comparison, in its analysis of the broader transportation sector (which includes airplane manufacturers and shipping concerns), the META Group found that as of October 2002, IT spending constituted an average of 4.17% of revenues through the first three quarters of this year, with companies anticipating that their IT spending would increase slightly to 4.27% of revenues in 2003. Estimates from Giga are in the same ballpark.

Comparative Estimates: IT Spending in the US Transportation Sector, 1999-2003 (as a % of company revenues)

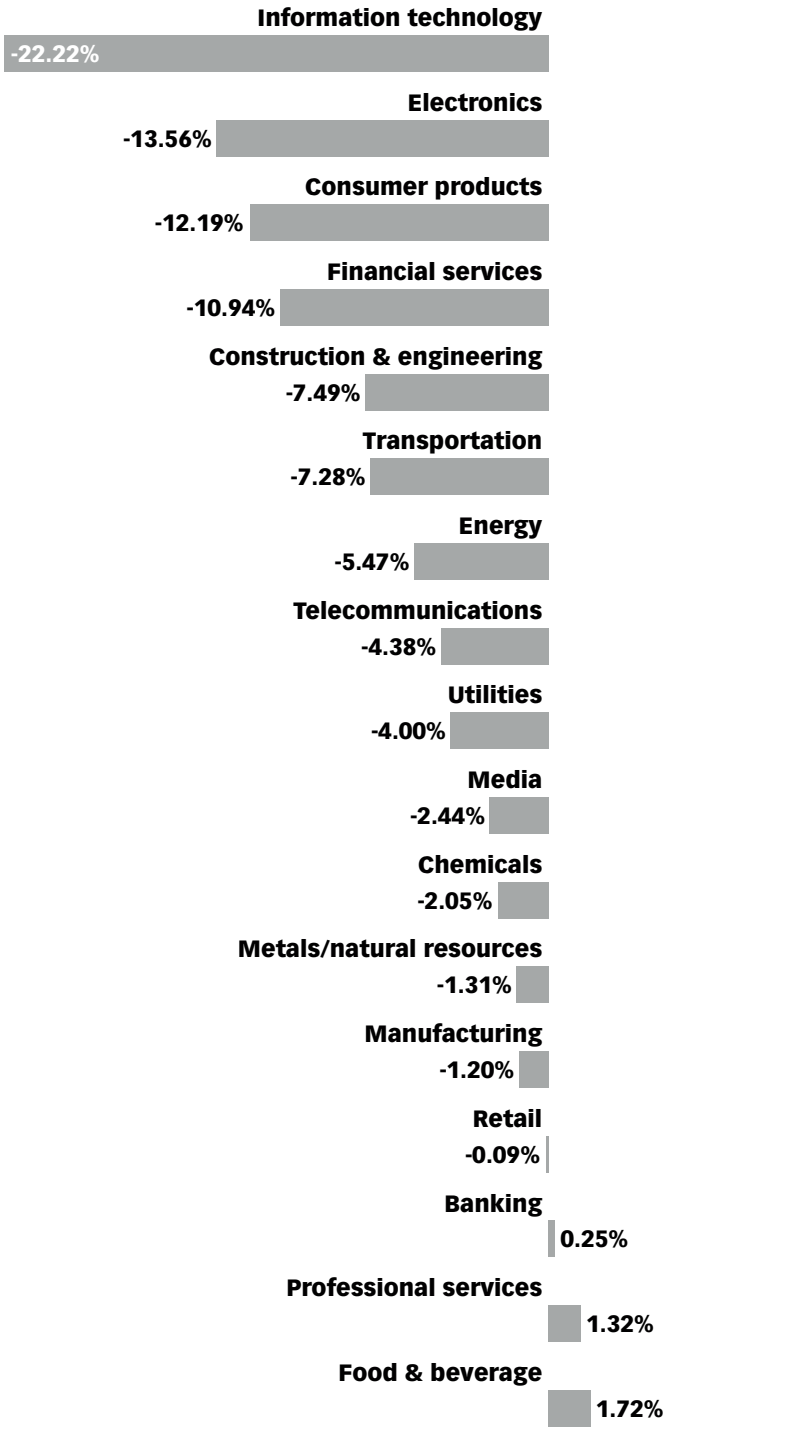
	1999	2000	2001	2002	2003
Giga Information Group	3.4%	4.5%	3.9%	3.5%	–
Meta Group	–	–	4.3%	4.2%	4.3%

Source: Giga Information Group, December 2001; META Group, October 2002

However, in terms of the dollar value of IT spending, firms in the transportation industry reduced their spending by a substantial 7.28% during the course of 2002. This was the sixth largest reduction among 21 industry segments that were surveyed by the META Group.

Firms in the transportation industry have been hit less badly by declines in revenues than other industries. In fact, several automotive manufacturers, buoyed by 0% financing, reported record quarterly earnings this year.

Change in US IT Spending, by Industry, 2001-2002



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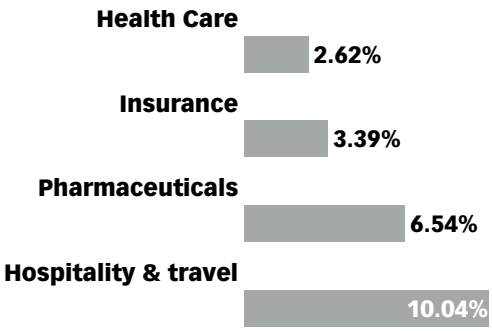
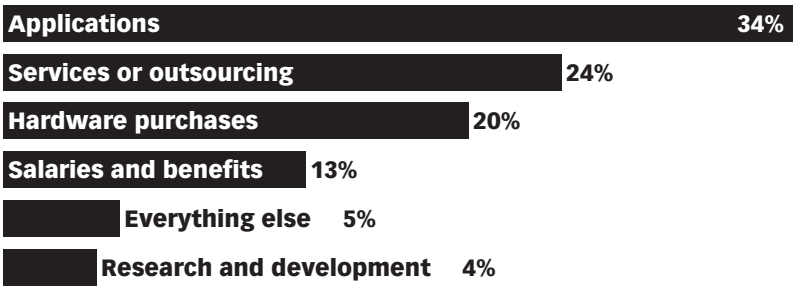


Source: META Group, October 2002

In its 2002 breakdown of automotive companies' IT spending, *InformationWeek* found that the greatest portion of automotive IT budgets was going toward applications and IT services or outsourcing. By comparison, in its 2001 survey, *InformationWeek* found that leading technology users in the automotive industry were spending 28% of their IT budgets on salaries and benefits, with 21% of their spending going towards applications. New technology purchases took up another 19% of automotive firms' IT budgets, followed by IT consulting and outsourcing, which had a 17% share of industry budgets.

Breakdown of Automotive Company IT Budgets, by Category, 2002



Note: n=22
Source: InformationWeek, September 2002

With IT services and outsourcing increasing from a 17% share of automotive manufacturers' budgets in 2001 to 24% in 2002, and the corresponding decline in salaries and benefits from 28% of IT budgets to 13%, it appears that leading technology users in the industry are turning to IT service providers as a means of reducing costs. This is a trend that is consistent across several industries, as many leading enterprises have started to feel more comfortable with outsourcing their non-essential IT operations to third-party service providers.

Similarly, IDC has noted that as a result of market conditions in Europe, where the current oversupply of automobiles is at its most critical,

automakers will be focusing their IT purchases on value-adding software upgrades designed to optimize supply chain and business management, rather than investing in expensive hardware upgrades. Automotive industry spending on software solutions in Western Europe will grow 11.7% in 2003, while hardware investments will contract by 3.2%.

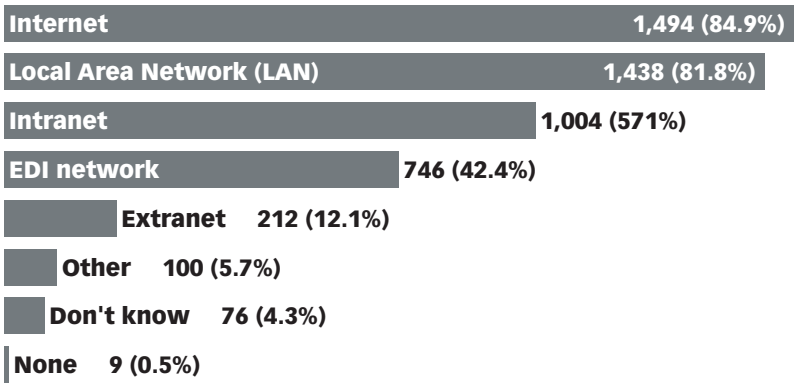
Over the long term, however, the prospects for spending on hardware, software and IT services within the automotive industry appear promising. According to IDC, IT spending in the US manufacturing sector in 2006 will reach $139.6 billion, with the automotive industry accounting for $19.5 billion of that total – second only to the high-tech industry, at $26.9 billion.

C. B2B E-Commerce Trade

As of 1999, the Computer Network Use Supplement of the US Census Bureau's Annual Survey of Manufacturers has been gathering detailed information about the e-commerce activity of 1,759 manufacturing plants in the US transportation equipment sector (NAICS code 336). Recall that based on calculations in the preceding section, the motor vehicle and parts industry represents approximately 74.1% of the transportation equipment sector.

In the expanded survey that it conducted in 2001, the Census Bureau found that the transportation equipment sector made extensive use of computer networks, with 84.9% of respondents using the internet for some part of their business operations. Compared with most other subsectors, the transportation equipment also had a relatively high deployment rate for local area networks and intranets, in addition to electronic data interchange (EDI) networks.

US Transportation Equipment Sector Manufacturing Plants' Use of Computer Networks, 2000 (in number of plants and as a % of respondents)



Note: n=1,759; multiple responses allowed
Source: US Census Bureau, March 2002

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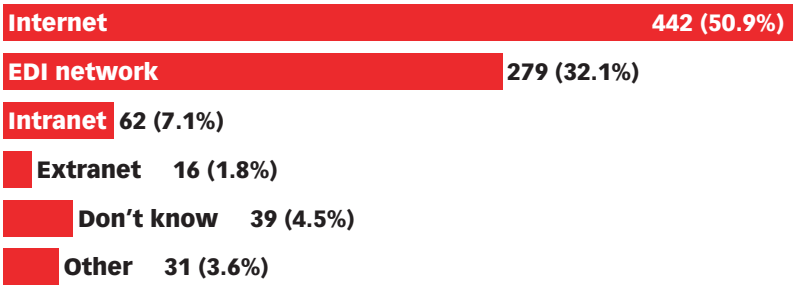
When electronic network use is divided between purchasing and selling activity, it is not surprising that more companies in the transportation equipment sector have the ability to buy rather than sell over the internet. For small businesses that want to do any kind of internet-based purchasing – be it for direct or indirect materials – all they need is a computer with an internet connection and a web browser. Unlike the ability to sell online, which is significantly more difficult to implement, small and medium-size companies require nothing more than a credit card to begin making limited online purchases.

Despite the relative ease with which companies may buy online, the US Census bureau found that 50% of the transportation equipment sector's manufacturing plants did not make electronic orders at all. Of those plants that did place electronic orders, 50.9% of respondents used the internet, while 32.1% used EDI.

US Transportation Equipment Sector Manufacturing Plants' Most Frequently Used Network to Place Electronic Orders, 2000 (in number of plants and as a % of respondents)



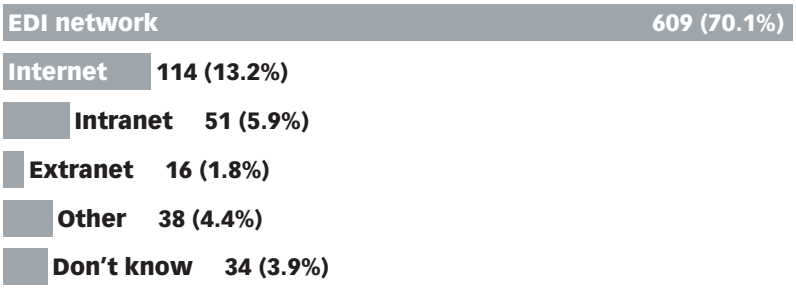
Note: n=869; multiple responses allowed
Source: US Census Bureau, March 2002

On the sell-side of their operations, it should come as no surprise that among those firms that do have the ability to sell goods electronically, EDI network use is more prevalent than internet-based sales. Until recently, only larger, Tier One suppliers in most industries have been able to participate in EDI networks, and thereby develop the ability to accept online orders.

Because few small and medium-size suppliers have been required to use electronic networks to sell goods to their larger trading partners in the past, most have continued to rely upon paper-based transactions. This has recently begun to change, however, as leading manufacturers and retailers have started to encourage suppliers to sign on to their internet-based EDI or e-procurement initiatives, many of which began to gain momentum in 2002.

Nonetheless, in the 2001 survey, a significant 50.7% of computer and electronics manufacturing plants said that they did not accept electronic orders of any kind. Of those firms that did accept such orders, the largest group said that their EDI network was the primary electronic channel through which they received electronic orders, followed by 13.2% of respondents that accepted most of their orders via the internet. Note that in the case of the automotive industry, the great predominance of these sales is likely to be parts or partially assembled components, and not fully finished vehicles.

US Transportation Equipment Sector Manufacturing Plants' Most Frequently Used Network to Accept Electronic Orders, 2000 (in number of plants and as a % of respondents)



Note: n=862; multiple responses allowed
Source: US Census Bureau, March 2002

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eMarketer believes that a significant number of companies will begin to accept electronic orders during the next two to three years, as several smaller suppliers will soon be required to connect with their larger trading partners via internet-EDI or internet-based private exchanges.

According to the non-profit Center for Automotive Research (CAR), only 15% of Tier One suppliers currently insist that trading partners use e-business networks to conduct transactions with their suppliers (those farther downstream). However, CAR believes that the figure will balloon to 77% in a manner of two to three years. The percentage of transactions taking place on e-business networks will swell commensurately, as the chart below demonstrates, with the anticipated cost reduction rising from 4.7% in 2001 to 17.7% by 2003-2004.

North American Tier One Auto Parts Suppliers' E-Business Activities, 2001 (as a % of respondents)

	Today	Within 2-3 years
Generic e-business capabilities		
Computer-to-computer communication (automated on both ends)	49%	78%
Computer-to-human communications (automated on one end)	29%	56%
Specific e-business activities		
CAD interoperability or similar CAD systems	28%	63%
Production planning	23%	70%
Logistics/order tracking	18%	66%
Integration between data sent to suppliers and their internal systems	15%	59%
Catalog pricing	15%	54%
Finished goods inventory	14%	63%

Source: Center for Automotive Research, August 2001

Industry-sponsored marketplace (ISM) Covisint, formed by DaimlerChrysler, Ford, General Motors and Commerce One, and later joined by Renault-Nissan, PSA Peugeot Citroen and Tier One suppliers Delphi Automotive Systems and Johnson Controls, has been trying to better connect buyers and sellers along the automotive value chain since its inception in 2000, with the goal of decreasing the vehicle development and order-to-delivery cycles for member companies and allowing for better integrated supply chain planning.

In April 2002, Covisint introduced a new two-unit structure to better address the needs of the leading automakers as well as suppliers of varying sizes at different points along the automotive value chain. The Strategic Sourcing unit provides the pricing and auction services for which Covisint is perhaps best known, while the Portal & Connectivity unit, an offering geared toward lower-volume suppliers, delivers services designed to improve communications and cooperation between manufacturers and suppliers.

Exchange Profile: Covisint Transaction Activity and E-Business Operations, 2001

Number of online auction events	1,400
Value of auction transactions	$51 billion
Value of eRFQ transactions	$100 billion
Number of online catalogs	200
Number of individual SKUs	2.5 million
Number of catalog transactions	95,000

Source: Covisint, 2002

Much of the efficiencies and cost savings member companies have gained have come through Covisint's RFQ tool. Cycle times have dropped to around two days from the 10 to 12 weeks required for traditional industry processes.

Benefits of Covisint's Marketplace RFQ Tool, 2002

Buyers	Sellers
Savings on auction commodities	Increased visibility to buyers
Lower operating costs	Greater auction participation
New business opportunities	Reduced bid response times
Enhanced competition in bid process	Lower negotiating lead times
Efficient building process for RFQ	Reduced bid process complexity
Fair market pricing transparency	Fair market pricing transparency

Source: Aberdeen Group, October 2002

Dollars and Cents

Turning to the measurement of the dollar value of e-commerce activity, the US Census Bureau's definition of e-commerce includes transactions for goods and services that are conducted via any electronic channel, which includes the internet as well as proprietary EDI networks. Note that e-commerce sales for motor vehicle, parts and supplies manufacturers are broken out under total merchant wholesale trade (NAICS code 42), rather than under transportation equipment as in the examples above.

Combined business-to-business e-commerce activity among all US manufacturers of motor vehicles, parts and supplies totaled $39.96 billion in 2000, an increase of 7.9% from $37.05 billion in 1999, with 99.6% of this activity taking place over EDI networks. Total online and offline trade for the US motor vehicle, parts and supplies industry was $199.63 billion in 2000, up slightly from $196.08 billion in 1999. As a portion of their total sales, US motor vehicle, parts and supplies manufacturers received a significant 20.0% of their revenues through e-commerce networks in 2000, versus 18.9% of their sales in 1999.

Value of US Motor Vehicle Parts and Supplies Manufacturers' E-Commerce Trade (including EDI), 1999 & 2000 (in billions and as a % of total industry trade)

Source: US Census Bureau, March 2002

eMarketer has found that firms in the US motor vehicle and parts manufacturing industry are open to adopting e-business solutions and as a group may be viewed as technology leaders, especially when compared with many other industries. As a component of the US B2B e-commerce model, data from the US Census Bureau's manufacturing and wholesale sector surveys forms the foundation of eMarketer's forecast estimates for the volume of internet-based trade between businesses in the computer and electronic products industry.

eMarketer projects that internet-based e-commerce (excluding EDI) between motor vehicle and parts manufacturers and their trading partners will grow from $85.22 billion in 2001 to $350.94 billion by 2005. As a portion of total industry sales, eMarketer estimates that internet-based trade accounted for just over 6.3% of total industry trade in 2001, while it is projected to grow to approximately 18.8% of industry trade within the next four years.

US B2B E-Commerce Trade for the Motor Vehicles and Parts Industry, 2001-2005 (in billions)

	2001	2002	2003	2004	2005
Total industry trade	$1,363.58	$1,475.94	$1,597.55	$1,729.19	$1,871.68
Internet-based trade	$85.22	$135.06	$199.69	$274.07	$350.94
Internet trade as a % of total trade	6.3%	9.2%	12.5%	15.8%	18.8%

Source: eMarketer, 2002

Despite this substantial growth that is expected for internet-based trade, eMarketer believes that EDI networks will continue to conduct the greatest portion of electronic trade over the next few years, as many of the industry's retail trading partners will prefer to slowly migrate EDI-based trade onto internet-based networks.

D. Buy-Side E-Business Initiatives

The US Census Bureau's Computer Network Use Survey found that very few transportation equipment manufacturers extensively shared online data with their supply chain partners in 2000. With the exception of electronic catalogs containing product descriptions, barely more than one-quarter of respondents were able to impart critical collaborative information such as order status or demand projections via any electronic channel. It is worthwhile to note, however, that less than one-fifth of transportation equipment manufacturers had the ability to share such supply chain information within their external trading partners, although the results were somewhat better in terms of internal communication of critical information.

US Transportation Equipment Sector Manufacturing Plants' Online Capabilities, 2000 (as a % of respondents)

	For other company units	For external customers	For external suppliers
Product descriptions or catalogs	26.1%	16.3%	37.2%
Demand projections	28.3%	19.6%	12.0%
Order status	30.1%	13.1%	28.0%
Production schedules	34.0%	15.9%	16.2%
Inventory data	37.3%	9.6%	9.6%
Logistics or transportation information	26.5%	15.3%	22.5%

Note: Multiple responses allowed
Source: US Census Bureau, March 2002

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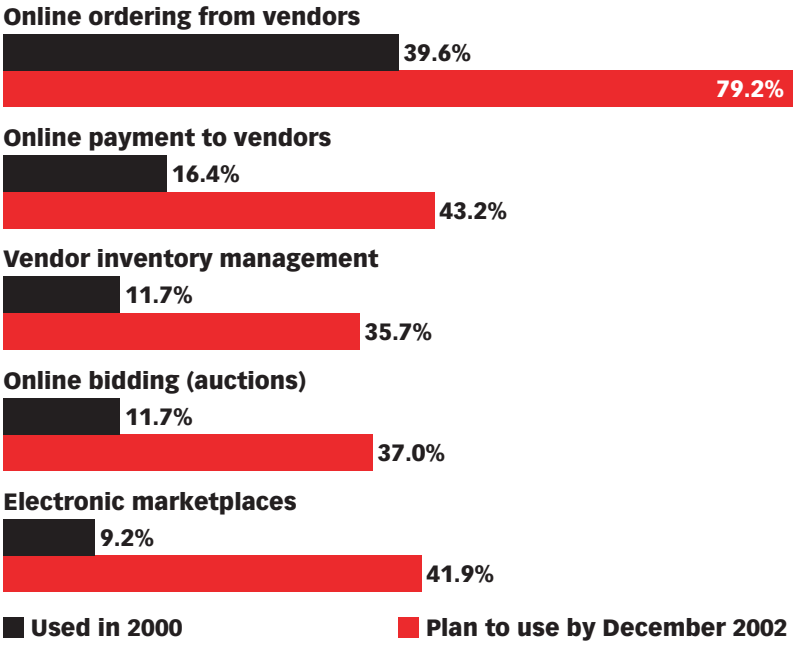
The US Census Bureau also found in its study that many transportation equipment manufacturers were already laying the foundation for greater supply chain coordination in 2000, with 39.6% of respondents doing some online ordering from their vendors. A total of 79.2% of manufacturers planned to have this capability by the end of 2002.

Although fewer manufacturers had adopted more advanced e-commerce solutions in 2000, over 40% of respondents to the US Census Bureau study planned to both be making online payments to their vendors by the end of 2002 and trading through electronic marketplaces by

December 2002. Although readers should, as a rule, exercise some degree of caution with predictions about technology adoption made while the internet boom was still at its height, the figures reported by the US Census Bureau, which resulted from an early 2001 survey, are in line with general trends in manufacturing.

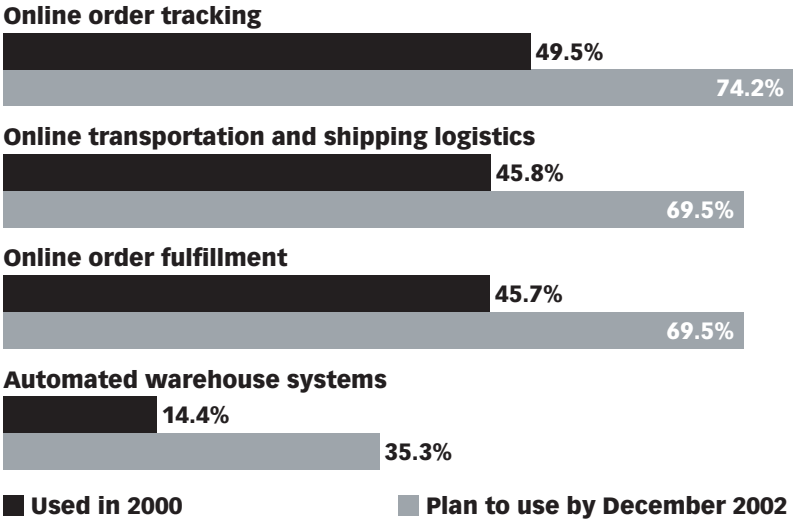
US Transportation Equipment Sector Manufacturing Plants' Current and Planned Use of E-Commerce Capabilities, 2000 & 2002 (as a % of respondents)



Note: Multiple responses allowed
Source: US Census Bureau, March 2002

As for e-business applications that are more closely related to logistical and warehouse operations, a considerable number of manufacturers were already using such systems in 2000. Adoption of automated warehouse systems lagged slightly behind these other systems, however.

US Transportation Equipment Sector Manufacturing Plants' Current and Planned Use of Online Order Management Capabilities, 2000 & 2002 (as a % of respondents)



Note: Multiple responses allowed
Source: US Census Bureau, March 2002

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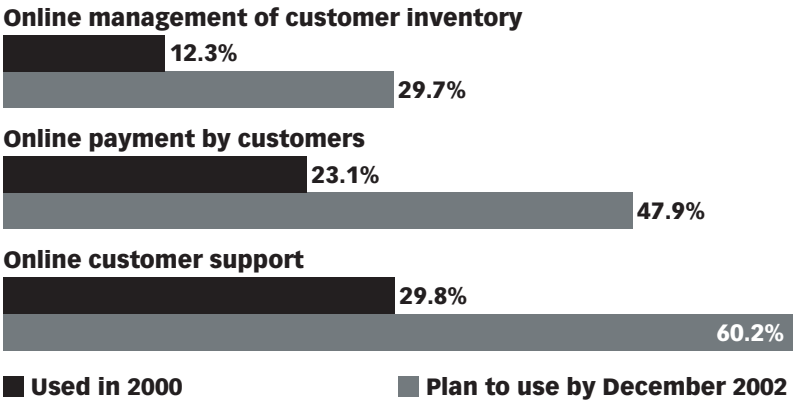
As many early adopters of new technologies have unfortunately learned through past failures, technology does not solve problems by itself. Instead, careful planning and coordination with key trading partners is what leads to successful technology implementations, which in turn leads to successful e-business collaboration between trading partners. Early lessons show not only that collaborative e-commerce solutions take time to implement, but also that the most successful implementations are done by those companies that are well-organized internally, as well as by those companies that already have good relationships with their key trading partners.

E. Sell-Side E-Business Initiatives

Faced with an increasingly competitive environment, due in large part to global oversupply and attractive financing designed to lure customers, many automotive manufacturers now see their future position in the marketplace as being closely tied to the success of their entire value chains. Greater collaboration with suppliers and trading partners has therefore become a priority, with the expectation that the adoption of new e-business solutions will help them gain better insight into the critical demand side of their operations.

The US Census Bureau found in its 2001 survey that just under 30% of transportation equipment manufacturers had taken the first steps toward closer collaboration by providing their customers with some form of online customer service. By the end of 2002, 60% – roughly double the percentage with the capability in 2000 – expected to have this capacity, while a growing number anticipated they would implement online payment and vendor-managed inventory systems by that point as well.

US Transportation Equipment Sector Manufacturing Plants' Current and Planned Use of Online Customer Service Capabilities, 2000 & 2002 (as a % of respondents)



Note: Multiple responses allowed
Source: US Census Bureau, March 2002

The internet as an advertising channel is still in an early stage of development. eMarketer estimates that overall spending on internet advertising in the United totaled $6.30 billion in 2002, a paltry figure in relation to the $231.90 billion Universal McCann calculates that US companies spent on traditional media. Moreover, online spending declined slightly from $7.21 billion in 2001, and was well off the peak it reached in 2000. Although the internet is becoming more widely accepted as a mainstream medium, online advertising, which, like traditional channels, has felt the industry-wide crunch, will not climb back toward year 2000 levels until 2005.

US Online Advertising Spending, 2000-2005 (in billions)

Note: eMarketer benchmarks its online advertising spending figures against the Interactive Advertising Bureau (IAB)/PricewaterhouseCoopers (PwC) data, for which the last full year measured was 2001
Source: eMarketer, December 2002

Nevertheless, the US online advertising market remains the world's most robust. By comparison, Europe, the world's second largest market, will not see levels of internet advertising spending comparable to those of the US until well into the second half of the decade.

Online Advertising Spending in Europe, 2002-2007 (in billions of €)

Source: Forrester Research, May 2002

For more information on the latest trends in online advertising, please see eMarketer's Online Advertising report at http://www.emarketer.com/products/report.php?advert_online

A. Online Advertising Spending

According to tallies by Nielsen Media Research, the automotive industry is the largest advertiser in the US, with spending nearly double that of the second-place restaurant industry. Although Nielsen does not include online advertising in the figures below (which may explain why its figure is considerably lower than the one reported by Taylor Nelson Sofres and Competitive Media Reporting), the chart is useful for helping readers to understand that as far as overall advertising is concerned – in any medium – the automotive industry is a behemoth.

Top 10 Product Categories in the US Based on Advertising Spending*, Q1 2001 & Q1 2002 (in millions)

	Q1 2002	Q1 2001
1. Automotive	$1,902.0	$1,732.3
2. Restaurants	$983.5	$864.2
3. Motion pictures	$663.7	$490.1
4. Prescription drugs	$614.3	$607.7
5. Telephone service	$599.9	$486.1
6. Department stores	$362.6	$299.7
7. Direct response services	$350.9	$304.8
8. Beer	$250.4	$183.4
9. Financial investment services	$247.3	$199.5
10. Auto dealership	$239.9	$207.1

*Note: *based on spending in the following media: Network TV, Cable TV, Hispanic TV, Spot TV, Syndicated TV, National Magazine, Spot Radio (19 markets), FSI Coupon*
Source: Nielsen Media Research, May 2002

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Figures from Taylor Nelson Sofres (TNS) and Competitive Media Reporting (CMR) likewise show the automotive industry to be the top advertiser in the US. Moreover, among the leading five industry categories, it was the only one to increase advertising spending in the year between the first quarters of 2001 and 2002.

US Ad Spending for Top Five Industry Categories, Q1 2001 vs. Q1 2002 (in billions and as a % increase/decrease vs. prior year)

	Q1 2001	Q1 2002	% change
Automotive	$3.47	$3.70	6.5%
Retail	$2.80	$2.79	-0.1%
Technology	$1.98	$1.91	-3.2%
Financial	$1.94	$1.77	-8.6%
Packaged foods	$1.55	$1.57	1.1%

Source: Taylor Nelson Sofres (TNS); Competitive Media Reporting (CMR), June 2002

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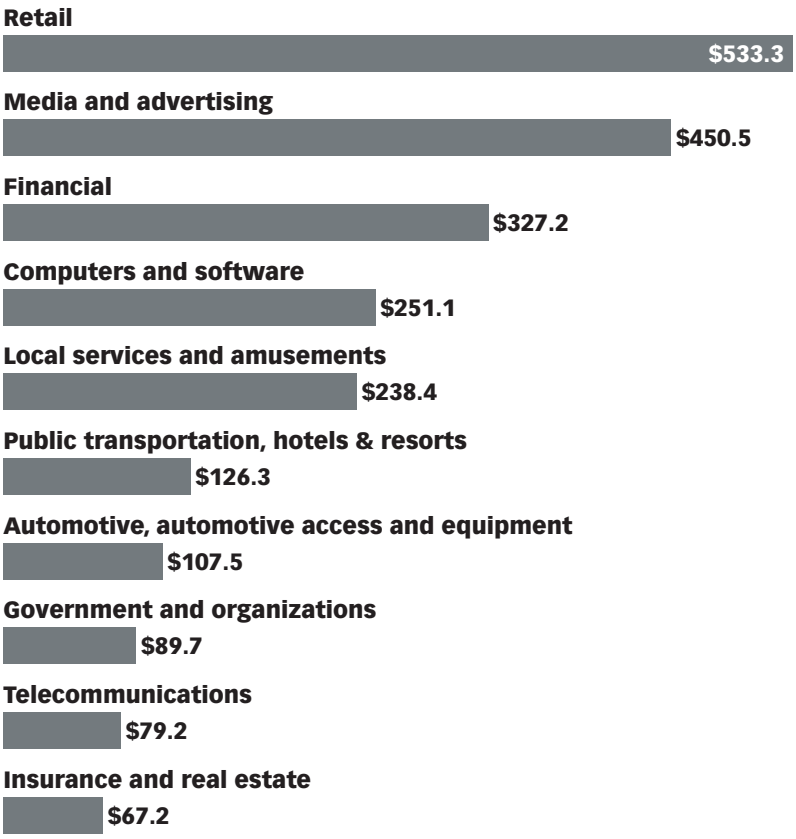
Even if it remains firmly committed to traditional media, the automotive industry has also been at the forefront of the drive to make the internet a viable advertising channel. To date, the resources automotive manufacturers have directed toward internet advertising campaigns represent a fraction of the dollars dedicated to advertising through traditional media, but they have nonetheless been significant. According to estimates from CMR, automotive companies spent $107.5 million on online advertising in 2001. This figure represents just one-fifth of the outlay by firms in the retail industry.

Top US Online Advertising Spending, by Industry, 2001 (in millions)



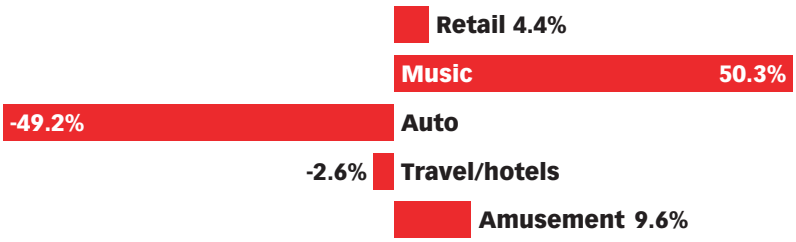
Source: CMRi's AdNetTrackUS, March 2002

"The auto industry is, by far, the most dominant influence on the growth of the media and advertising sector."

– Jack Meyers Report, 5 November 2002

By all signs, however, 2001 represented the first of several down years in the online advertising business. According to the Interactive Advertising Bureau (IAB), which publishes quarterly studies on online advertising in the US in conjunction with global consultancy PricewaterhouseCoopers (PwC), the automotive industry reduced its internet advertising spend by nearly 50% from 2000 to 2001.

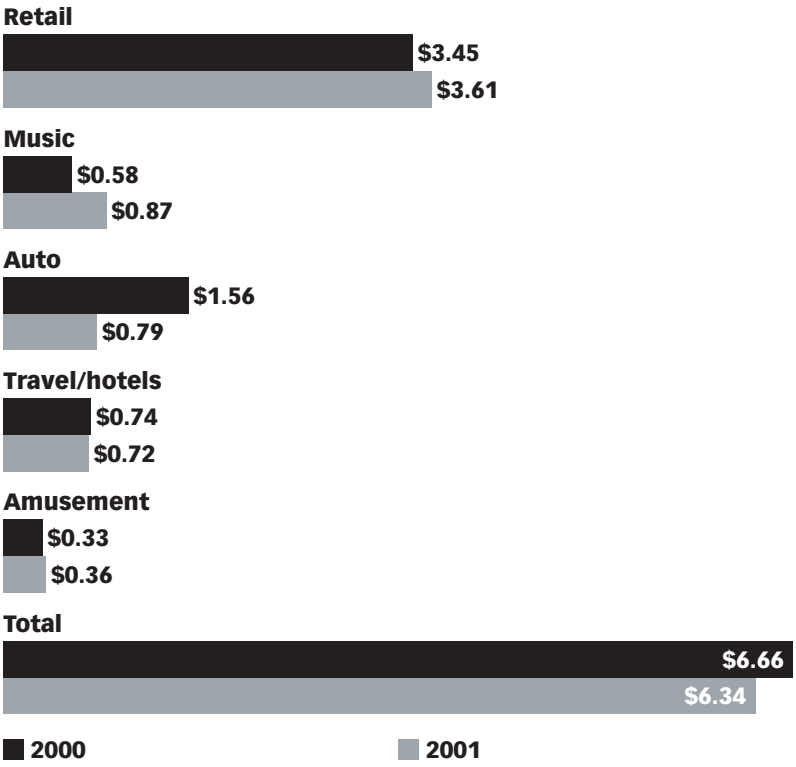
US Online Advertising Spending, by Major Consumer Category, 2001 (as a % increase/decrease vs. prior year)



Note: total spending for 2000=$8.23 billion; for 2001=$7.21 billion; top five major consumer categories accounted for 81% of 2000 total spending, 88% of 2001 total spending
Source: Interactive Advertising Bureau (IAB), PricewaterhouseCoopers (PwC), June 2002

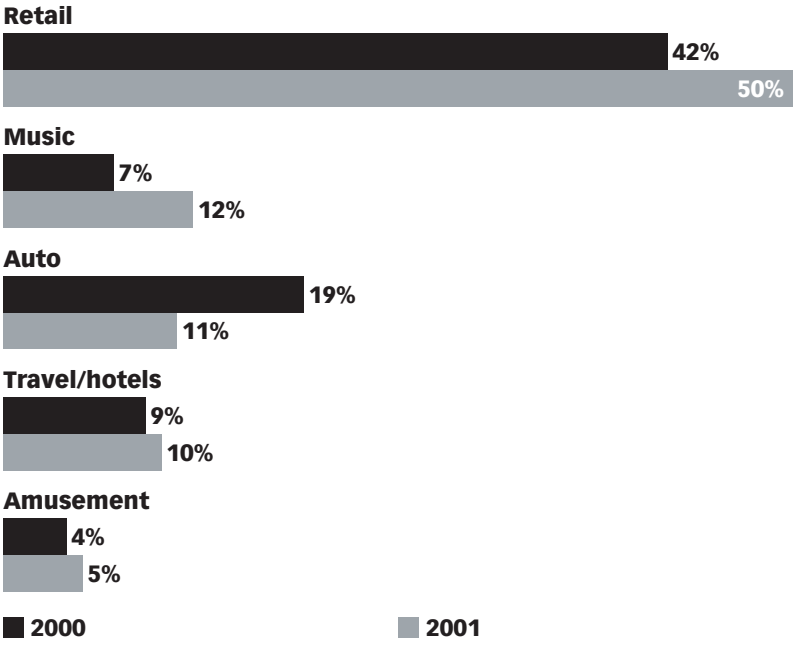
In dollar and percentage terms, automotive went from being the second largest category in 2000 to the third in 2001. While spending by automakers formerly represented more than that by music and travel firms combined, in 2001, it was slightly less than music and roughly equal to that of travel.

US Online Advertising Spending, by Major Consumer Category, 2000 & 2001 (in billions)



Note: total spending for 2000=$8.23 billion; for 2001=$7.21 billion; top five major consumer categories accounted for 81% of 2000 total spending, 88% of 2001 total spending
Source: Interactive Advertising Bureau (IAB), PricewaterhouseCoopers (PwC), June 2002

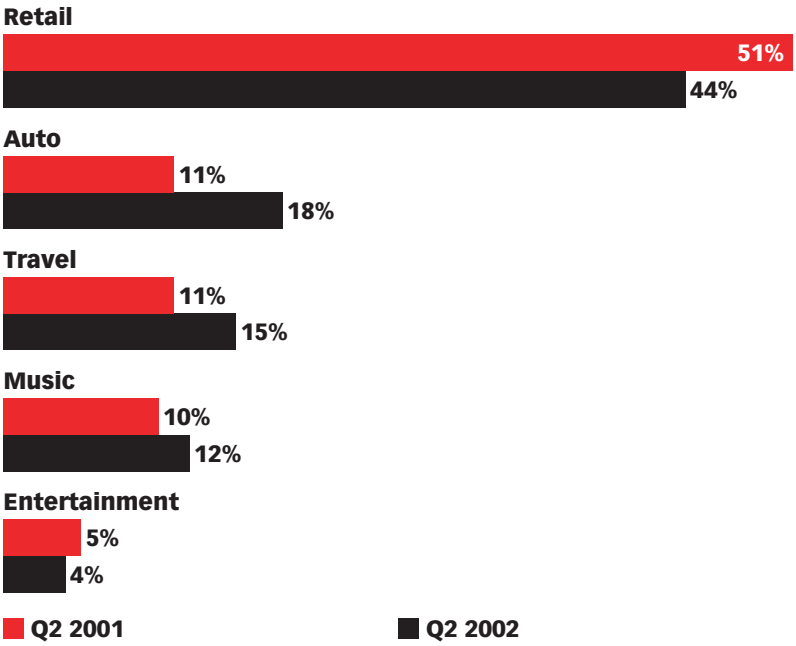
US Online Advertising Spending, by Major Consumer Category, 2000 & 2001 (as a % of total spending)



Note: total spending for 2000=$8.23 billion; for 2001=$7.21 billion; top five major consumer categories accounted for 81% of 2000 total spending, 88% of 2001 total spending
Source: Interactive Advertising Bureau (IAB), PricewaterhouseCoopers (PwC), June 2002

However, Q2 2002 spending figures from the IAB show that firms in the retail industry pulled back from the internet, dropping from 51% of the total online spend in the second quarter of 2001 to 44% in the corresponding quarter in 2002. Auto advertising rose to an 18% market share, undoubtedly due to auto manufacturers' reliance on more expensive rich media advertising.

US Online Advertising Spending, by Major Consumer Category, Q2 2001 vs. Q2 2002 (as a % of total spending)



Note: total ad spending for Q2 2001=$1.87 billion, for Q2 2002=$1.46 billion
Source: Interactive Advertising Bureau (IAB)/PricewaterhouseCoopers (PwC), October 2002

Over a roughly analogous period – May 2001 to May 2002 – Nielsen//NetRatings' AdRelevance unit observed more than 100% growth in the number of online advertising impressions by automotive industry firms. Still, at 1.9 billion impressions, the automotive industry remains a relatively minor player in terms of total ad volume.

Top US Online Advertisers, by Industry, May 2001 & May 2002 (in billions of impressions and % growth)

	May 2001	May 2002	% growth
1. Retail goods & services	19.4	33.8	74%
2. Financial services	9.1	14.4	59%
3. Web media	8.8	12.1	38%
4. Travel	1.3	5.4	304%
5. Entertainment	2.5	4.3	70%
6. Consumer goods	2.8	4.1	46%
7. Telecommunications	0.9	3.7	277%
8. Health	1.1	3.5	221%
9. Hardware & electronics	1.2	3.3	178%
10. B2B	3.8	3.2	-17%
11. Public services	0.7	2.7	272%
12. Automotive	0.8	1.9	136%
13. Software	0.8	1.9	147%

Source: Nielsen//NetRatings AdRelevance, June 2002

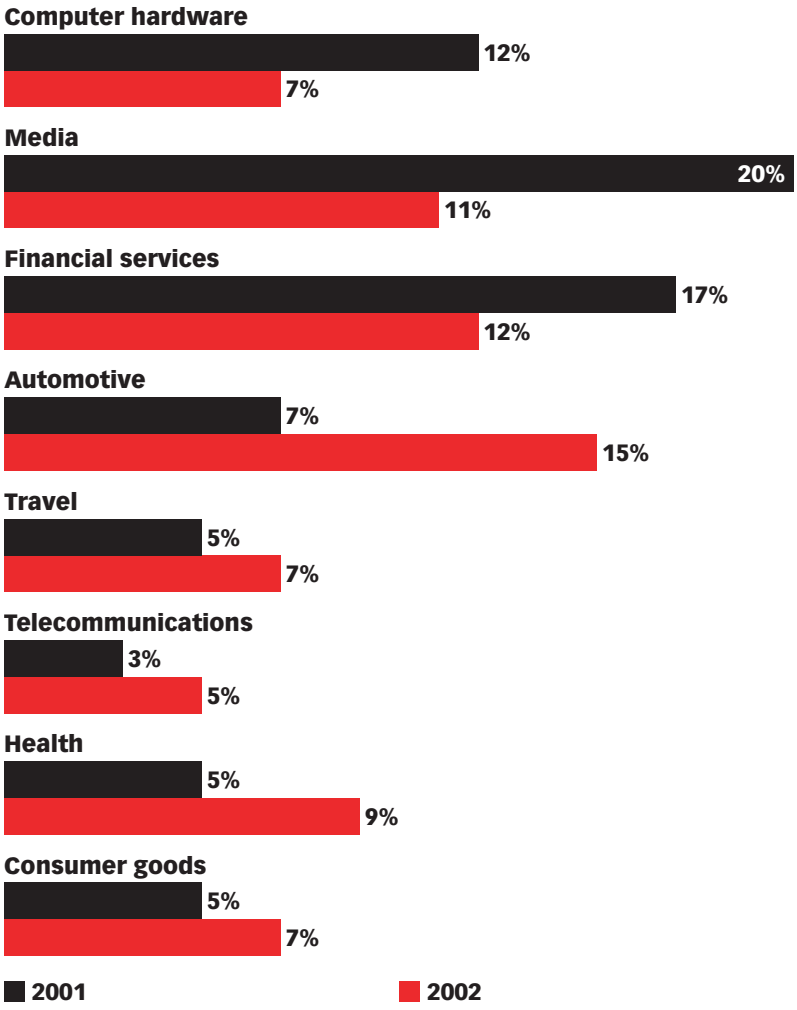
Jupiter Research, ever confident in the internet as an advertising medium, projects nothing but growth in the years ahead where the automotive industry and the web are concerned. Between 2002 and 2007, Jupiter expects online advertising spending by automakers to nearly triple.

US Automotive Online Ad Spending, 2001, 2002 & 2007 (in billions)

Source: Jupiter Research, July 2002; eMarketer calculations, December 2002

Jupiter figures also show that the automotive industry, a laggard in online advertising as late as 2001, has now surged to the fore. Whereas in 2001 it was just the fourth largest online advertiser, in 2002 it climbed into the lead as computer hardware, media and financial services firms reduced their online ad spend. Note that Jupiter's industry breakdown differs from that used by the other research firms cited above, with the retail industry broken down into component categories.

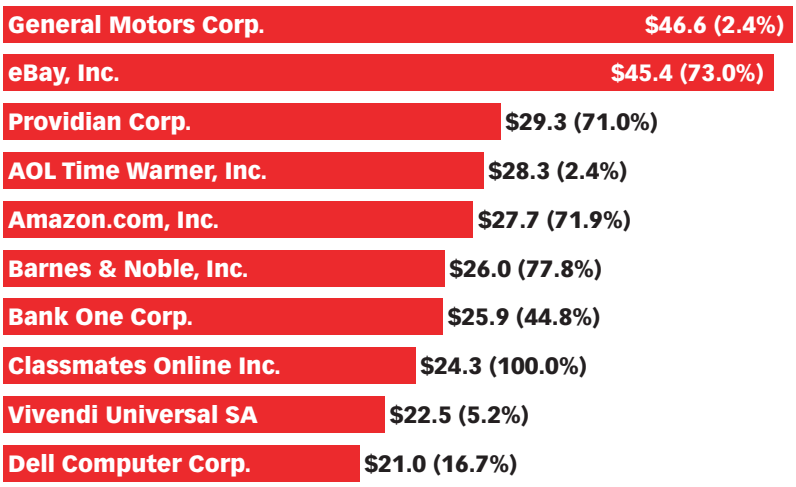
US Online Ad Spending, by Industry, 2001 & 2002 (as a % of total online ad spending)



Source: Jupiter Research, October 2002

In terms of the range of companies drawn to internet advertising, so-called old-economy companies like GM rule the roost. According to CMR, GM was the biggest spender in 2001, at $46.6 million. However, that spending needs to be put into the context of GM's total advertising spending, which CMR puts at $1.93 billion, making the Detroit giant's online ad spend a mere 2.4% of its total outlay.

Top US Online Advertising Spending, by Company, 2001 (in millions and as a % of total advertising)



Source: CMRi's AdNetTrackUS, March 2002

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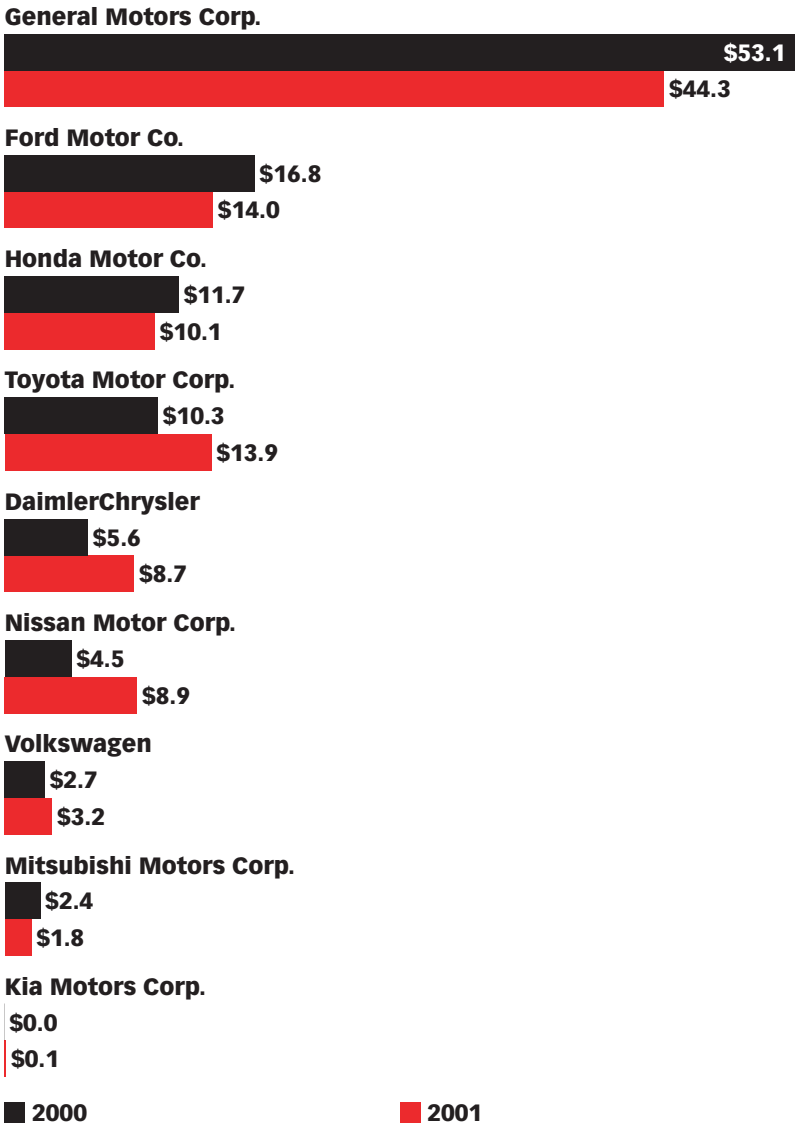
According to *Advertising Age*'s annual survey of the top 100 advertisers in the US, online advertising by one of the leading automobile manufacturers retailers – Nissan, which has experienced a return to profitability under the ownership of Renault – increased by 98% between 2000 and 2001. Others posting increases were Toyota (up 35%), DaimlerChrysler (up 38%) and Volkswagen (up 19%). However, several manufacturers, including GM, Ford, Honda and Mitsubishi, saw reductions in their online advertising spending.

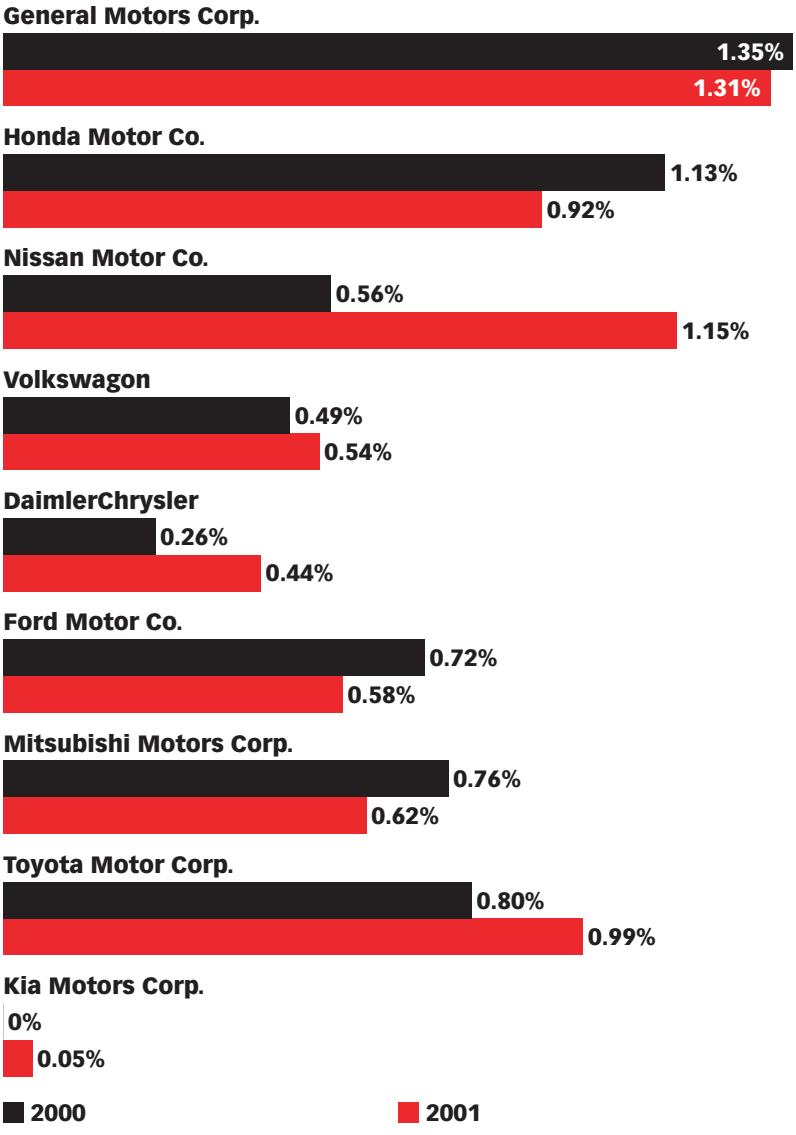
Leading US Automotive Manufacturers' Online Advertising Spending, 2000 & 2001 (in millions)



Source: Advertising Age, June 2002

Altogether, the top 100 advertisers from the *Advertising Age* study spent an average 2.5% of their overall advertising budgets on internet ads in 2001. By comparison, no auto manufacturer directed even close to 2.0% of their advertising dollars online in either 2000 or 2001. Rather, the leading advertisers in the automotive industry spent an average 0.73% of their total 2001 ad budgets online.

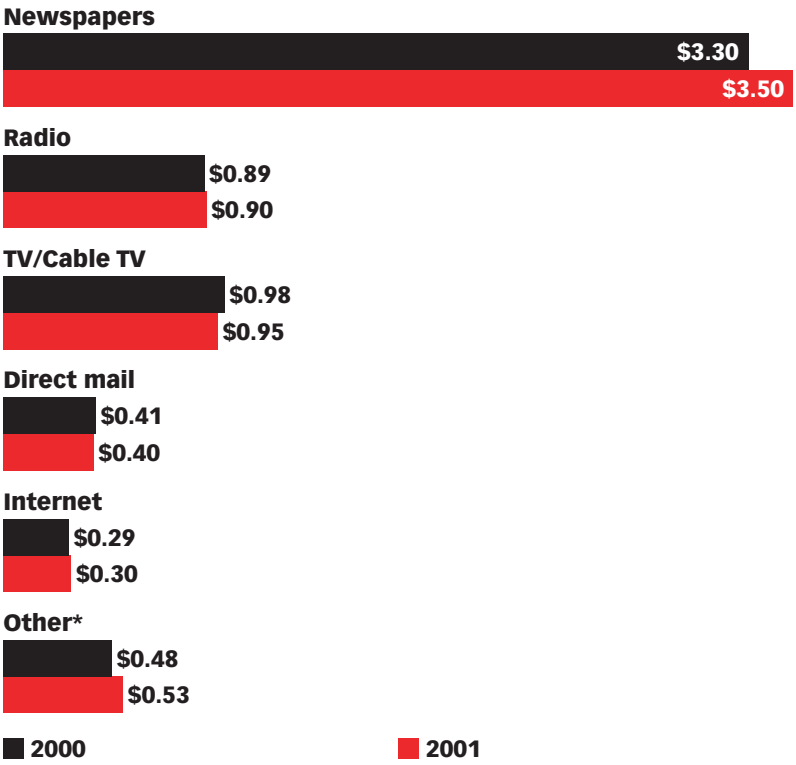
Leading US Automotive Manufacturers' Online Advertising Spending, 2000 & 2001 (as a % of total advertising budget)



Source: Advertising Age, June 2002

Dealers, meanwhile, have continued to dedicate more of their advertising dollars to the internet, even while ad spend on other media has decreased. According to the National Automobile Dealers Association (NADA), a trade group for franchised dealers in the US, dealers decreased their spending on television ads and direct mail pieces from 2000 to 2001, while their internet budget rose 4.5%, climbing to $305 million.

Advertising Spending of US Auto Dealerships, by Media, 2000 & 2001 (in millions)



*Note: *includes items such as community/event sponsorship, billboard/transit ads, yellow pages/shopper flyers and magazines*
Source: National Automobile Dealers Association (NADA), September 2002

B. Leading Ad Formats

Rich Media Favored by Automakers

Rich media advertisements, defined by the IAB as "a method of communication that incorporates animation, sound, video, and/or interactivity," can be delivered by banner ad, e-mail, interstitial, button or pop-up. eMarketer research indicates that the flat nature of conventional banner ads rarely appeals to traditional companies like auto manufacturers, which are accustomed to using video and audio elements in their marketing campaigns. However, the number of broadband households is rising, and this has opened online doors to more companies used to marketing television-style.

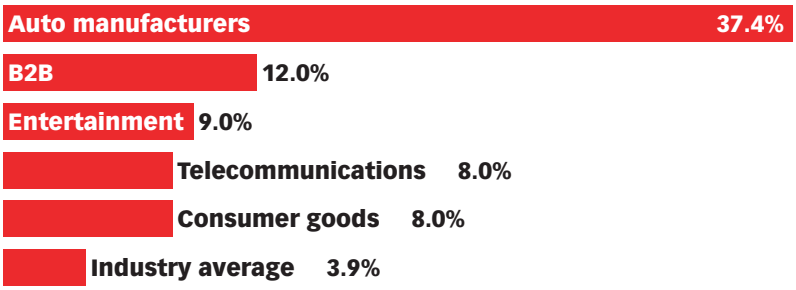
Comparative Estimates: Broadband Households in the US, 2000-2005 (in millions)

	2000	2001	2002	2003	2004	2005
Adams Media Research, May 2001	5.9	10.7	16.8	22.2	27.1	–
BDRC/European Union, August 2001	5.2	9.7	17.2	22.6	–	–
eMarketer, June 2002	**6.2**	**11.2**	**16.8**	**23.3**	**30.5**	**–**
Federal Communications Commission*, February 2002	–	7.8	–	–	–	–
Gartner Dataquest, October 2001	6.1	11.8	18.5	25.8	32.2	–
Harris Interactive, September 2001	–	14.9	–	–	–	–
International Data Corporation (IDC), July 2001	–	–	–	20.0	–	–
Jupiter Research, December 2000	5.2	8.6	13.3	18.5	23.8	–
Kinetic Strategies, March 2002	–	10.8	–	–	–	–
NetProfit, August 2001	6.5	14.4	22.4	30.4	42.5	–
OECD, October 2001	6.2	8.8*	–	–	–	–
Parks Associates, August 2000	–	11.0	16.0	22.1	29.8	38.8
PricewaterhouseCoopers (PwC), May 2001	3.8	8.2	13.2	18.3	23.1	27.5
Strategis Group, January 2001	6.1	11.6	17.6	23.5	29.6	–
US Department of Commerce, October 2000	4.7	–	–	–	–	–
Yankee Group, April 2002	–	–	16.0	21.3	26.7	31.1

*Note: eMarketer's year 2000 and 2001 baselines are based on end of year 2000 and June 2001 figures from the Organization for Economic Cooperation and Development (OECD); *subscribers as of 30 June 2001*
Source: eMarketer, June 2002; various, as noted, 2000-2002

With ads that zoom or float across the screen, full-motion video in separate windows, sound effects, and inviting music, auto manufacturers were the leading users of rich media advertising in the second quarter of 2002, garnering 37.4% of their ad impressions that quarter from rich media.

Top US Industries Using Rich Media Advertising, Q2 2002 (as a % of each industry's total online ad impressions)



Note: Rich media ad formats include generic flash, java-enabled ads and branded technologies such as Eyeblaster, Shoshkele, Unicast, Enliven and Bluestreak
Source: Nielsen//NetRatings AdRelevance, August 2002

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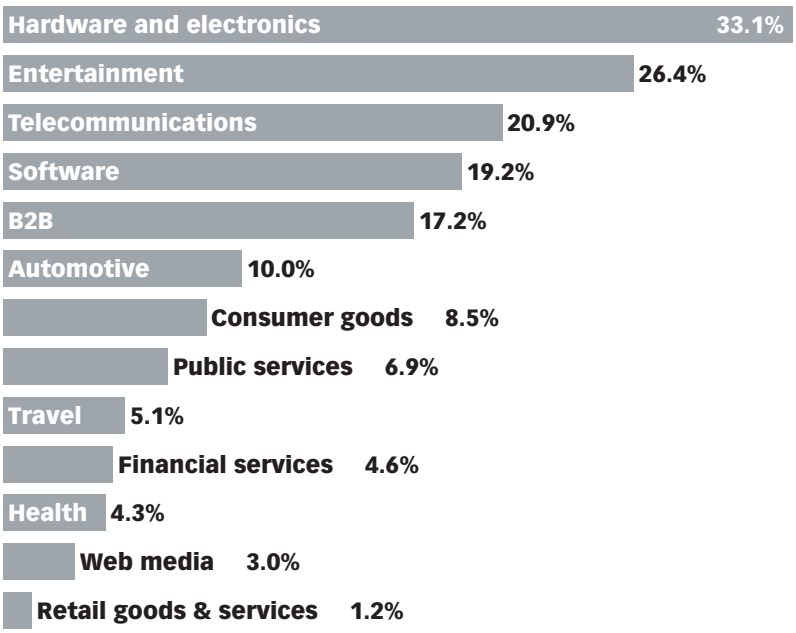
Usage may be cyclical, as suggested by the two charts below. The first provides data for the month of October 2002, during which rich media accounted for only 10% of the automotive industry's total online ad impressions, while hardware and electronics firms, perhaps because they were gearing up for the holiday shopping season, showed the most intense use of rich media. In the second chart below, marketers from diverse industries were among the top 10 rich media advertisers for the first quarter of 2002, according to Nielsen//NetRatings, but General Motors was the lone automotive industry representative.

Percent of Ad Impressions Devoted to Rich Media among US Industries, October 2002



Source: Nielsen//NetRatings AdRelevance, November 2002

Top 10 Rich Media Advertisers in the US for Home and Work Users, Q1 2002 (in thousands of impressions)

1. Virtumundo, Inc.	154,335
2. Nextel Communications, Inc.	111,835
3. State Farm Insurance Company	101,060
4. The Procter and Gamble Company	53,358
5. Verizon Communications, Inc.	44,086
6. The Coca Cola Company	40,326
7. General Motors Corporation	26,930
8. AstraZeneca Pharmaceuticals LP	23,663
9. United States Federal Government	21,312
10. Vivendi Universal S.A.	20,561

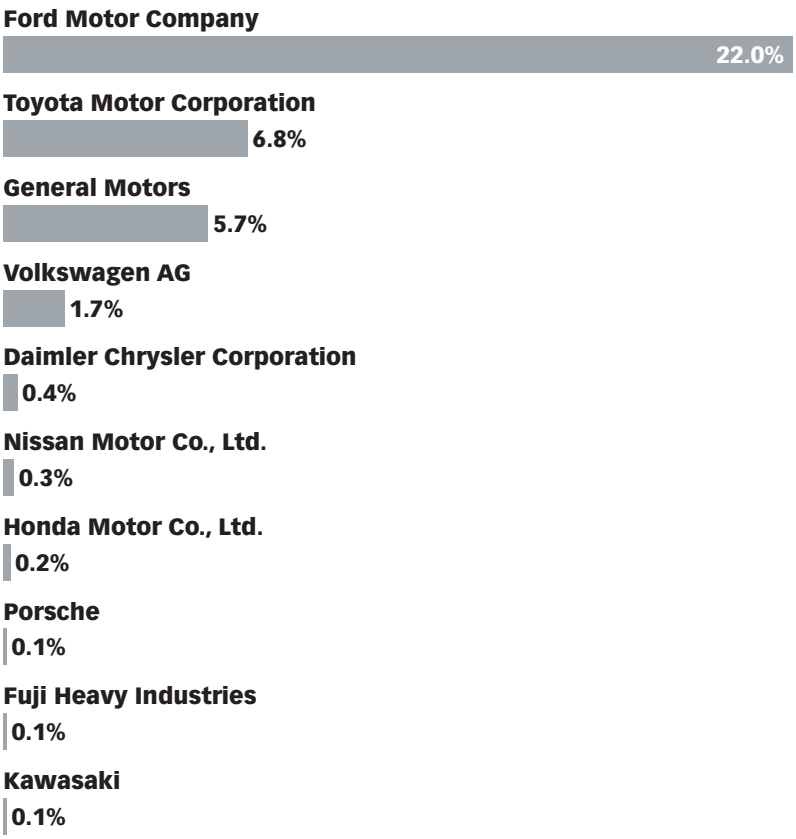
Source: Nielsen//NetRatings AdRelevance, May 2002

"But now, with rich media, [big companies] are finding more of a kinship with the traditional ads they're used to."

– Charles Buchwalter, vice president of client analytics, Nielsen//NetRatings

However, the absence of other automakers from the list of leading users of rich media is not to suggest that car manufacturers are not devotees of the format. Ford, in particular, was the industry leader in the second quarter of 2002, as the chart below demonstrates, while Toyota and GM were a distant second and third.

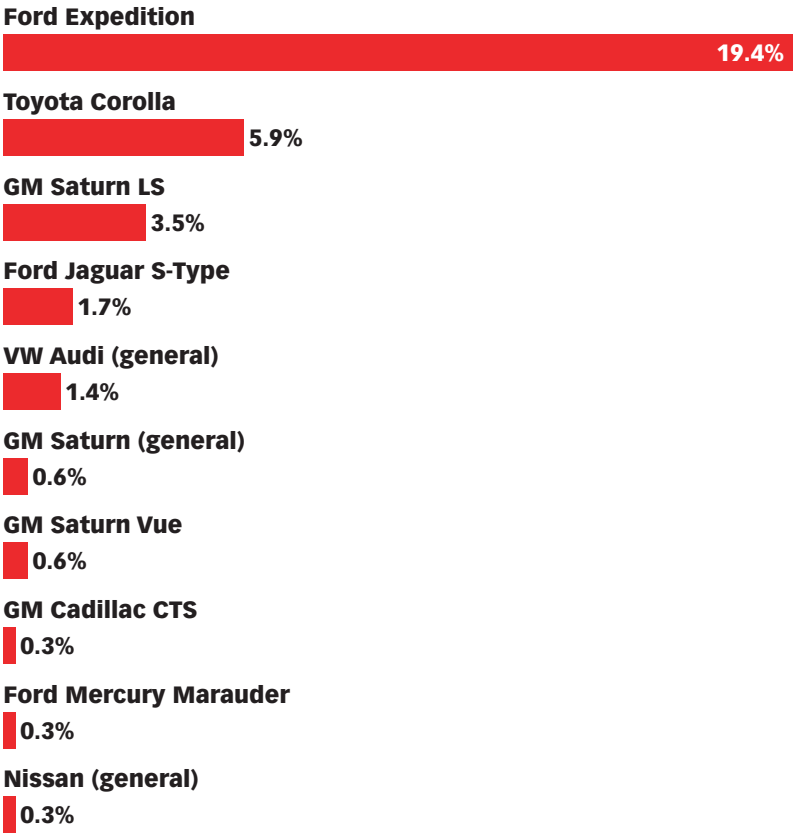
Top Auto Parent Companies Using Rich Media Advertising, Q2 2002 (as a % of all auto ad impressions)



Source: Nielsen//NetRatings AdRelevance, July 2002

The chart below shows that automakers deploy rich media to market a range of models from high-volume entry-level models such as the Toyota Corolla to more expensive (and considerably more lucrative) SUVs like the Ford Expedition, the second largest in Ford's stable. On the whole, manufacturers seem to have targeted newer models or those being reintroduced with modifications, such as Jaguar's S-Type or the Saturn LS.

Top US Automotive Products/Brands Using Rich Media Advertising, Q2 2002 (as a % of all auto ad impressions)



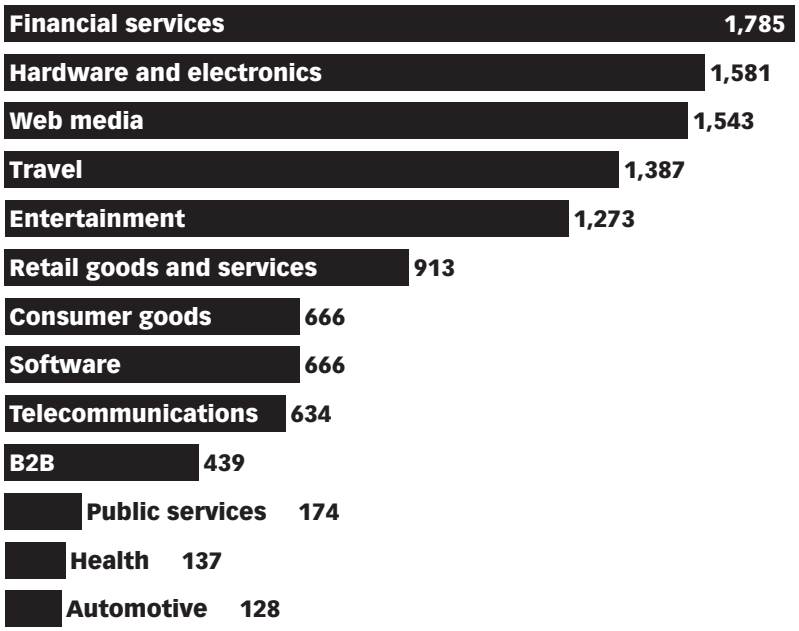
Note: Rich media ad formats include generic flash, java-enabled ads and branded technologies such as Eyeblaster, Shoshkele, Unicast, Enliven and Bluestreak
Source: Nielsen//NetRatings AdRelevance, August 2002

Broadband makes for more effective rich media ads, and broadband access is growing rapidly. For more about the subject, see eMarketer's "Broadband & Dial-Up Access" report at: http://www.emarketer.com/products/report.php?broad_dialup

Nobody Likes the Pop-Up

Among online advertising formats, few are as despised as the pop-up. Fortunately, for car lovers at least, pop-up ads constitute a relatively small part of automakers' arsenal of online marketing tools. Although Nielsen//NetRatings' AdRelevance division found that 63 companies account for 80% of all pop-up ad impressions (2,145 companies account for the other 20%), automotive was by far the smallest industry. Note that the AdRelevance study defined pop-ups as any ad that spawns a new browser without user input. This includes pop-up ads that focus to the front or back (pop-under) of the active browser window.

Top US Industries Using Pop-Up Ads, Ranked by Impressions, January-July 2002 (in millions)



Source: Nielsen//NetRatings AdRelevance, August 2002

"For advertising to be effective, it has to be intrusive. Just like any medium, there will be the extreme cases where both the quantity and quality of [online] advertising will be excessive and distasteful. This shouldn't distract us from the fact that mainstream publishers can also use the pop-ups in an effective and appropriate way."

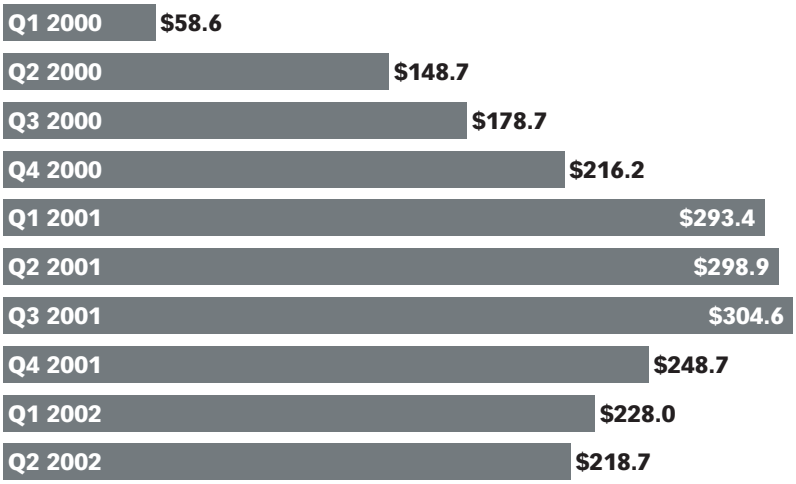
– Safa Rashtchy, senior research analyst, US Bancorp Piper Jaffray

Use of Classified Ads on the Rise

Of the online advertising vehicles that saw considerable expansion in 2001, classifieds received more dollars than either paid search or rich media. Not as chic or sexy as those other two vehicles, classifieds are necessary, basic and individually inexpensive.

During the eight quarters of 2000 and 2001, spending on online classified ads grew steadily until the general social and economic malaise of the fourth quarter of 2001. According to IAB/PwC research, total online classified ad spending in 2001 hit $1.15 billion, but in the first two quarters of 2002, online classified spending fell further, dropping to $218.7 million in Q2 2002 – a low not seen since Q4 2000.

Online Classified Ad Spending in the US, by Quarter, Q1 2000-Q2 2002 (in millions)



Note: total for 2000=$602.2; total for 2001=$1,145.6
Source: Interactive Advertising Bureau/PricewaterhouseCoopers (PwC), October 2002

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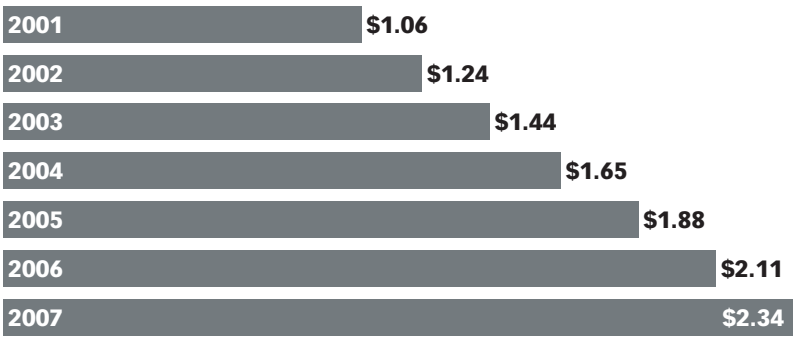
The IAB/PwC figure for 2001 is nearly the same as Jupiter Research's estimate of $1.06 billion. Projecting over several more years, Jupiter sees a steady climb for online classified spending, with the market topping the $2 billion mark by 2006.

For Jupiter, online classifieds occupy a significant share of the US online advertising universe. Currently in the 20%-plus range, Jupiter projects the market to peak at 23.2% in 2003 and then drop to 16.7% in the four years following.

Online Classified Ad Spending in the US, 2001-2007 (in billions)



Source: Jupiter Research, October 2002

By narrowing the focus from the entire online classified market to specific categories, Jupiter not only projects spending patterns but also paints a priority list among classifieds. As expected, ads for recruitment (help wanted) make up the majority of the online classified palette, rising from $799 million in 2002 to $1,498 million in 2007, or about 64% of all interactive classifieds. Automobile sales are and will remain a distant third through 2007, oscillating between 9.1% and 9.9% of the classified market.

Online Classified Ad Spending in the US, by Ad Category, 2001-2007 (in millions)

	2001	2002	2003	2004	2005	2006	2007
Recruitment	$683	$799	$923	$1,057	$1,207	$1,354	$1,498
Real estate	$209	$241	$274	$310	$350	$387	$424
Automotive	$97	$115	$135	$157	$182	$206	$231
Personals	$48	$59	$71	$84	$99	$114	$130
For sale	$8	$10	$12	$15	$17	$20	$23
Other	$16	$19	$22	$25	$29	$32	$36
Total	**$1,061**	**$1,242**	**$1,436**	**$1,648**	**$1,884**	**$2,114**	**$2,343**

Note: numbers may not add up to total due to rounding
Source: Jupiter Research, April 2002

Online Classified Ad Spending in the US, by Ad Category, 2001-2007 (as a % of total)

	2001	2002	2003	2004	2005	2006	2007
Recruitment	64.4%	64.3%	64.3%	64.1%	64.1%	64.0%	63.9%
Real estate	19.7%	19.4%	19.1%	18.8%	18.6%	18.3%	18.1%
Automotive	9.1%	9.3%	9.4%	9.5%	9.7%	9.7%	9.9%
Personals	4.5%	4.8%	4.9%	5.1%	5.3%	5.4%	5.5%
For sale	0.8%	0.8%	0.8%	0.9%	0.9%	0.9%	1.0%
Other	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Total (in millions)	**$1,061**	**$1,242**	**$1,436**	**$1,648**	**$1,884**	**$2,114**	**$2,343**

Source: Jupiter Research, April 2002; calculated by eMarketer, October 2002

The growth rates among classified categories are best looked at in comparison to the total market growth rates, the bottom line in the chart below. Automobile ads will continue to grow at a higher rate than the total classified universe in all six years shown.

Online Classified Ad Spending in the US, by Ad Category, 2002-2007 (as a % increase vs. prior year)

	2002	2003	2004	2005	2006	2007
Recruitment	17.0%	15.5%	14.5%	14.2%	12.2%	10.6%
Real estate	15.3%	13.7%	13.1%	12.9%	10.6%	9.6%
Automotive	18.6%	17.4%	16.3%	15.9%	13.2%	12.1%
Personals	22.9%	20.3%	18.3%	17.9%	15.2%	14.0%
For sale	25.0%	20.0%	25.0%	13.3%	17.6%	15.0%
Other	18.8%	15.8%	13.6%	16.0%	10.3%	12.5%
Total	**17.1%**	**15.6%**	**14.8%**	**14.3%**	**12.2%**	**10.8%**

Source: Jupiter Research, April 2002; calculated by eMarketer, October 2002

Product Tie-Ins

Traditional media, television in particular, have long tied cars to activities and "lifestyles." Televised sporting events, with their large male audiences, regularly serve as a platform for manufacturers looking to market their vehicles. This synergy has now spread to the internet. At this point, however, vehicle, parts and aftermarket vendors remain a relatively small part of the universe of companies advertising on sporting websites.

Ad Impressions on Sport Sites, by Industry, July & August 2002 (in millions)

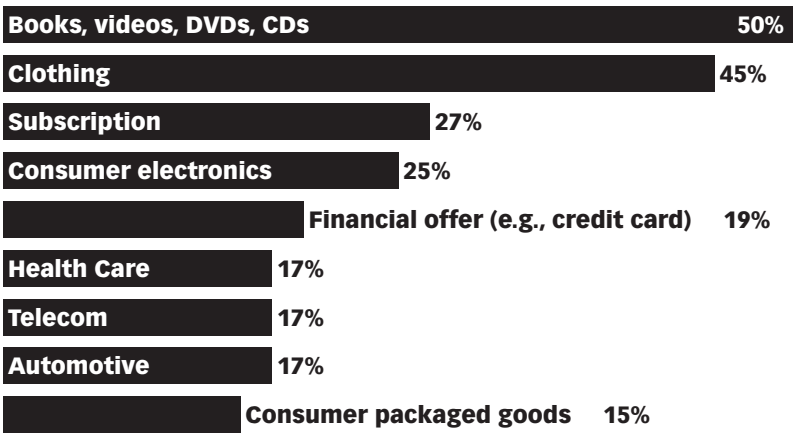
	July 2002	August 2002	% change
Retail goods & services	720	1,398	94%
Web media	954	1,033	8%
Consumer goods	602	625	4%
Travel	422	319	-24%
B2B	369	284	-23%
Financial services	270	274	2%
Entertainment	129	191	48%
Telecommunications	116	165	43%
Automotive	207	149	-28%
Software	68	133	95%
Hardware & electronics	106	107	1%
Public services	84	85	1%
Health	41	60	47%

Note: among at-home and at-work internet users
Source: Nielsen//NetRatings AdRelevance, September 2002

C. Interactive Marketing

The August 2002 *DIRECT* magazine and Yankelovich report, "Consumer Outlook: An Exclusive Study of Consumer Attitudes About Direct Marketing," observed that "mention direct marketing and with instant, knee-jerk predictability consumers complain." However, the data suggests otherwise. Of the 1,000 people aged 16 and over that participated in the survey and who received a variety of direct marketing pieces (including online offers), a significant percentage bought or at least sought additional information as a result. A comparatively small percentage bought cars or automotive products, but this is not surprising given that they were far and away the biggest-ticket items on the list.

Products and Services US Consumers Researched or Bought via Direct Marketing*, 2002 (as a % of respondents)



*Note: *responded to direct marketing offer in six months prior to survey either by seeking additional information or making a purchase*
Source: Direct Magazine, Yankelovich, August 2002

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The Direct Marketing Association (DMA) report, "Economic Impact: US Direct & Interactive Marketing Today," predicted that within the direct marketing segment of interactive media, depository institutions (banks and such) would spend the most in 2002. Spending by car dealers and service stations was estimated to be roughly one-third of that total, at $59.6 million.

US Consumer Interactive Media Advertising Spending for Direct Marketing, by Industry, 2002 (in millions)

continued on page 75

Transport services*
$37.1

Airlines
$37.0

General merchandise stores
$36.2

Social services
$30.9

Food/kindred products
$28.9

Total
$1,261.9

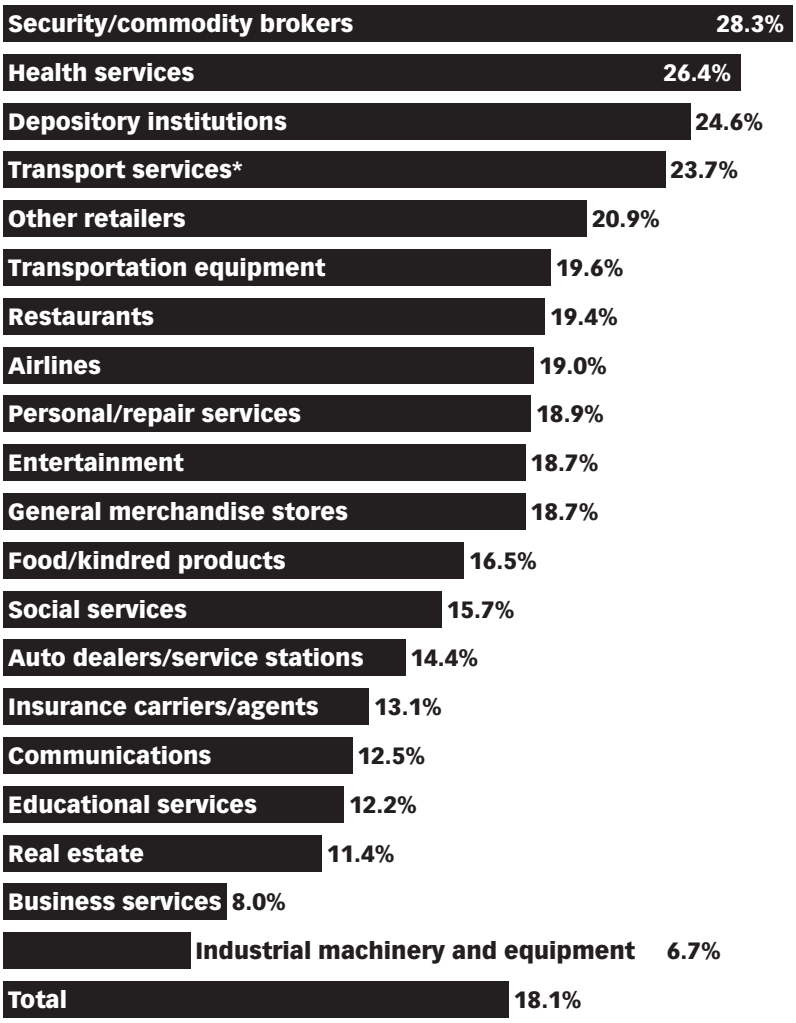
*Note: *excludes airlines*
Source: Direct Marketing Association, July 2002

"…Consumers are offended not by direct marketing per se, only by its shortcomings."

– DIRECT magazine, "Consumer Outlook" report, August 2002

Turning those same numbers into growth rates, the DMA expected just modest increases for auto dealers and service stations in 2002. In fact, their projected increase in ad spending for interactive direct marketing of 14.4% was below the industry average of 18.1%.

US Consumer Interactive Media Advertising Spending for Direct Marketing, by Industry, 2002 (as a % increase vs. prior year)



*Note: *excludes airlines; total for 2001=$1,068.3, for 2002=$1,261.9*
Source: Direct Marketing Association, July 2002

BMW Films – Taking Online Marketing to the Next Level

Cars have been a central feature of films and television shows as long as these media have been in existence. Entire movies in the tradition of "Herbie the Love Bug" and "Bullitt," as well as television shows like "Knight Rider," have been crafted around the appeal of a single car, while others, from "Grand Prix" (1966) to "The Cannonball Run" (1981) to "Driven" (2001) have celebrated the art, pleasures and dangers of driving. In short, cars have been as much a part of contemporary culture and lore as popular media.

The brand-building possibilities associated with the ever-increasing reach of films and television – perhaps the best known and most highly recognized US export – has not been lost on automakers. Paid product placement has reached a fever pitch in recent years, from the coup BMW scored when it supplanted first Aston Martin, then Lotus and again Aston Martin as super-spy James Bond's car of choice in 1995's "GoldenEye," which served as the worldwide introduction of its new Z3 roadster, to 2002's "Men in Black II," which put Mercedes' new E-Class on the screen long before it was on the road. Ford, now the owner of a revitalized Aston Martin, bought back the license to drive the world's most famous film franchise in 2002's "Die Another Day" for a rumored $50 million (the film also featured a modified Jaguar XKR and Ford Thunderbird). These are examples of the ways in which one franchise can "aid" another.

BMW took a decidedly different tack in 2001, when, in addition to its other marketing efforts, introduced a series of short films collectively known as "The Hire." Helmed by famous film directors from around the world, each of the films centered around a BMW model piloted by a mysterious character simply named "the driver," played by British actor Clive Owen (a second series began running in 2002, following the same format).

"'The Hire' is a campaign that is itself supported by an ad campaign."

–Adweek.com, 21 November 2002

The films were distinguished by their considerable budgets (up to $5 million in some instances), high production values, well-known casts and taut storytelling. Initially available for viewing only a special website created by the automaker – BMWFilms.com – the films sparked debate: were they art or commerce or some kind of emergent hybrid? BMW marketed the films with trailers and posters as if they were a typical cinematic release and although the company's only stipulation to the films' creators was that each had to feature a BMW model, the name BMW is never mentioned in any of the films.

However, BMW came up with clever ways of reaching out to potential customers. In order to view the films, visitors to the website had to register and then could watch streaming versions of the films or download a BMW-branded film player developed in conjunction with QuickTime. Several million people registered, and a high percentage also opted to receive additional information from BMW. By all signs, the films have been an extraordinary success and raised BMW's brand profile considerably. Not only that, they have proved to be an excellent vehicle for bringing consumers to the web. As the online iMedia Connection put it, the company responsible for building the "Ultimate Driving Machine" was suddenly behind the "ultimate interactive marketing campaign." Other manufacturers have begun to offer short films on their websites, and while some contain a storyline, they are more recognizably commercial (and less artistic or plot-driven) than the BMW films.

Wallpaper, Screensaver and TV Commercial Downloads

Another method that automakers have used to literally bring their products – from an entire model range to specific vehicles – to consumers' desktops is by making available wallpaper and screensaver downloads on their websites. Some of the screensaver downloads are static, while others are interactive and provide images as well as additional information about a product line.

A number of manufacturer websites also allow visitors to view TV spots with streaming audio and video. While this is a value-added feature that may serve to reinforce branding messages from other media, it is not a qualitatively different step along the lines of the BMW films noted in the preceding section.

Automobile Manufacturer Websites Featuring Wallpaper and Screensaver Downloads and Streaming TV Commercials - Part One, 2002

	Wallpaper	Screensaver	TV commercials
BMW brands			
BMW	Yes	Yes	No
Mini	Yes	Yes	No
Rolls-Royce	No	No	No
DaimlerChrysler brands			
Chrysler	Yes	Yes	No
Dodge	Yes	Yes	No
Jeep	Yes	No	No
Maybach	Yes	No	No
Mercedes-Benz	Yes	Yes	Yes
Fiat brands			

continued on page 79

Alfa Romeo	Yes	Yes	No
Ferrari	Yes	Yes	No
Fiat Auto	Yes	No	Yes
Lancia	Yes	Yes	No
Maserati	Yes	Yes	No
Ford brands			
Aston Martin	Yes	No	No
Ford	Yes	Yes	No
Jaguar	No	No	No
Land Rover	Yes	No	No
Lincoln	No	No	No
Mazda	Yes	Yes	Yes
Mercury	Yes	No	No
Volvo	Yes	No	No
General Motors brands			
Buick	Yes	No	No
Cadillac	No	No	Yes
Chevrolet	Yes	Yes	No
Daewood	No	Yes	Yes
GMC	No	No	No
Holden	Yes	Yes	Yes
HUMMER	Yes	No	Yes
Oldsmobile	No	Yes	No
Opel	Yes	No	No
Pontiac	Yes	No	Yes
Saturn	Yes	No	No
Saab	Yes	Yes	No
Vauxhall	Yes	Yes	Yes

Note: some features pertain to non-US websites; not all features present on all country-specific websites
Source: company websites, 2002; eMarketer, December 2002

Automobile Manufacturer Websites Featuring Wallpaper and Screensaver Downloads and Streaming TV Commercials - Part Two, 2002

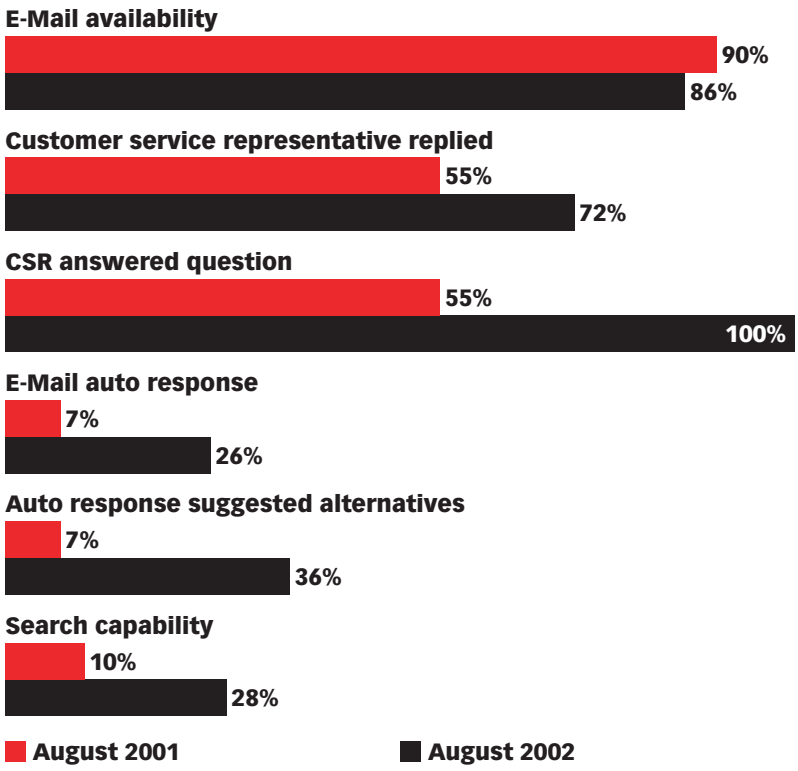
	Wallpaper	Screensaver	TV commercials
Honda brands			
Acura	Yes	Yes	No
Honda	No	Yes	No
Hyundai Motor Group brands			
Hyundai	Yes	Yes	Yes
Kia	Yes	No	No
Isuzu	No	No	No
Lotus	Yes	No	No
MG Rover Group brands			
MG	No	No	No
Rover	No	No	No
Nissan brands			
Infiniti	Yes	No	Yes
Nissan	Yes	No	No
Porsche	Yes	Yes	No
PSA Group brands			
Citroen	Yes	Yes	No
Peugot	Yes	Yes	Yes
Renault	Yes	Yes	No
Subaru	Yes	No	Yes
Suzuki	No	No	Yes
Toyota brands			
Lexus	Yes	Yes	No
Toyota	Yes	Yes	Yes
Volkswagon brands			
Audi	Yes	Yes	Yes
Bentley	No	Yes	No
Bugatti	Yes	No	No
Lamborghini	Yes	Yes	No
SEAT	Yes	No	No
Skoda	Yes	Yes	No
Volkswagon	Yes	Yes	Yes

Note: some features pertain to non-US websites; not all features present on all country-specific websites
Source: company websites; eMarketer, December 2002

D. Managing Customer Contact and Relationships

The more automotive manufacturers seek to use the internet as a marketing and sales vehicle, the more they will have to focus on online customer relationship management (CRM) as well. The results of the October 2002 "Automotive CRM" study by Jupiter Research – an inquiry into the CRM capabilities of a broad range of automotive websites, including those from manufacturers, content and information portals, and buying and finance sites – indicate that overall, online management of customer contact has improved considerably in the past year, particularly where the responsiveness and effectiveness of customer service representatives are concerned.

Operational CRM Capabilities of US Automotive Sites, August 2001 & August 2002 (as a % of sites surveyed)

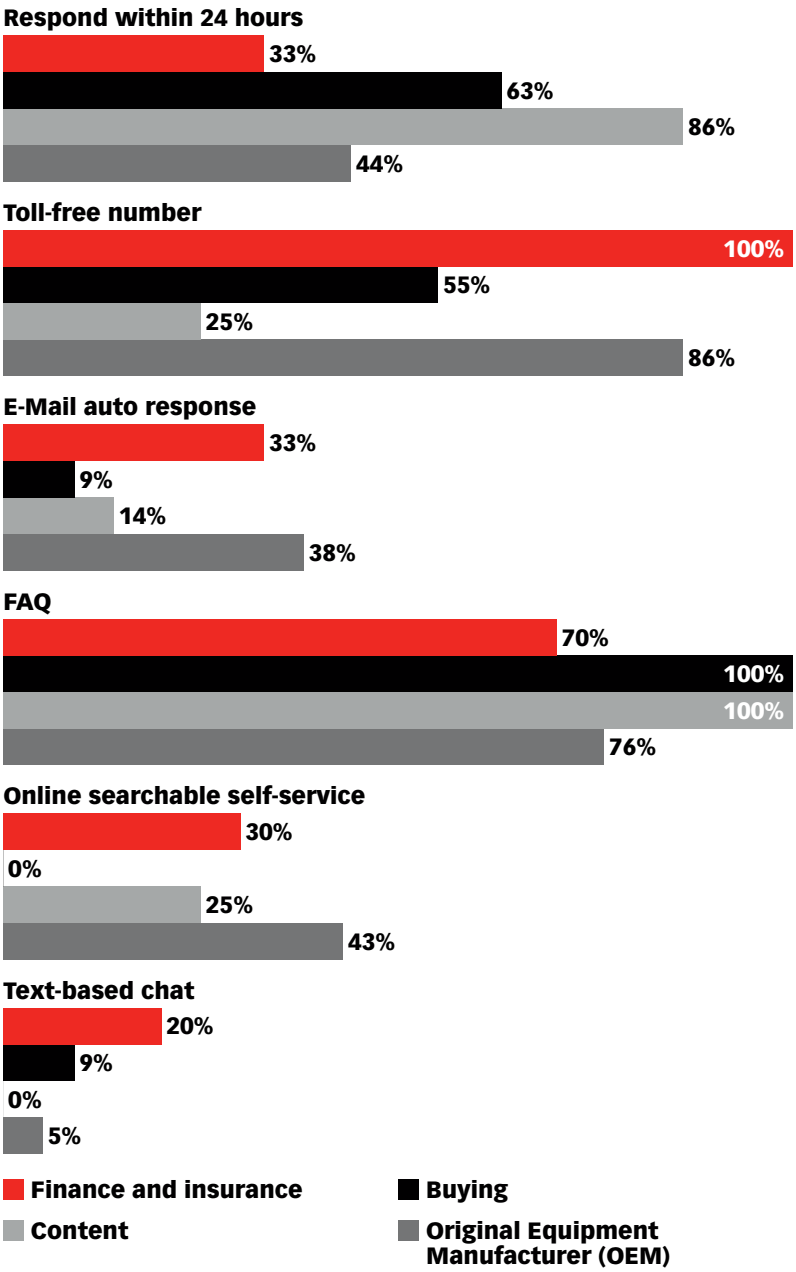


Source: Jupiter Research, October 2002

However, the study also suggests that while automotive OEMs offer consumers feature-rich websites, including e-mail auto response to customer queries and listings of toll-free numbers and frequently asked questions (FAQ), they tend to be less responsive than third-party sites where customer service is concerned. The 24-hour response rate of manufacturer websites was a little more than half that of content sites (44%

versus 86%) and considerably lower than the 63% response rate recorded for sites dedicated to online purchases of automobiles. Not surprisingly, the websites of luxury-car manufacturers, whose clientele is notoriously demanding, performed better, with 80% responding within 24 hours (versus just 27% of other manufacturers).

Operational CRM Capabilities of US Automotive Sites, by Type of Site, August 2002 (as a % of sites surveyed)



Note: n=50
Source: Jupiter Research, October 2002

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"Inability to meet customers' expectations will result, over the long term, in defection to sites that are more customer friendly, while those sites losing traffic will pay more for leads and advertising to get the consumers back."

– Jupiter Research, "Automotive CRM" report, 23 October 2002

Wealthy consumers should not be the only ones who receive good service online, especially given that 88% of internet users surveyed by Jupiter expect responses within a 24-hour timeframe. Ignoring this reality will prove costly in long run, in terms of both lost customers and added customer service costs. Jupiter, for example, found that overall, 95% of online consumers would make a second attempt at contacting the site owner (be it an OEM or third-party content or service provider), and 57% would attempt the second contact by phone. Reducing these additional and unnecessary second contacts will directly benefit the bottom line of OEMs and owners of third-party automotive websites.

Given that OEM websites have tended to underperform in relation to third-party content and service sites, improving online customer service should be a top priority. The operating budgets of most OEMs are such that they should be in the position to operate sophisticated CRM tools. However, they may not yet be fully in place.

As a means of improving CRM performance, Jupiter suggests a three-tiered approach:

- Manual: for those sites with a limited number of customer service representatives and which typically take longer than 24 hours to respond to customer queries, driving up response times should take precedence.
- Automatic: for sites with limited a self-service capacity and which take anywhere from six to 24 hours to respond to e-mail queries, focusing on increasing automation and adding or enhancing self-service options should be the top goals.
- Turbo: for sites whose online CRM performance is beyond the industry average, improving analytical capabilities so as to better drive leads to the appropriate recipient within the organization should take priority.

"Consumer behavior is difficult to predict, as Internet research behavior is complex, vehicle purchases are infrequent and life cycle events and in-market timing often unknown to the OEM."

– Bob Trine, global lead consultant for CRM in the automotive industry, Cap Gemini Ernst & Young (CGEY)

Overall, the message consumers are sending is clear: if automobile manufacturers are serious about using the internet as a marketing and sales channel, they must be equally serious about servicing that channel. Otherwise, they risk alienating customers they might otherwise have brought into the fold.

A. Consumer Activities

First Steps: The Research Phase

Ample evidence exists that many consumers go online at the beginning of the car shopping process. The Vividence Corporation, which surveyed the interaction of 400 online consumers with five OEM websites (two each from the US and Japan and one from Europe), found that 94% of US car buyers went online as a first step, versus 82% who visited specific automaker websites and 67% who went into an actual dealership. That the Vividence study would point to the primacy of the internet at the initial stage of purchasing is unsurprising, particularly given that the prospective car buyers were recruited from an online panel, whose online activities may not be reflective of the US car-buying population as a whole.

Nevertheless, automotive websites offer many features from which even inexperienced internet users can profit. In particular, consumers can avail themselves of numerous websites offering vehicle reviews, model comparisons and reliability data. In addition, on most automaker websites, they can configure the desired model with preferred options and features and ultimately come up with a price.

Where US Consumers Go When Shopping for a Vehicle, March 2002 (as a % of respondents beginning the car shopping process)

*Note: *Researching vehicles, requesting quotes from dealers, ordering brochures; **Research particular models or to request dealer quotes*
Source: Vividence Corporation, June 2002

Sampling a different population than Vividence, quality and satisfaction rating firm J.D. Power and Associates came up with comparable results in a survey of 27,383 consumers who purchased a car in 2002. It found that 60% of the respondents used the internet when shopping for a car. Of these roughly 16,000 consumers, 88% visited automotive websites before physically going to a car dealership for a test drive, no doubt in large part to narrow down their brand and model choices.

The report also notes that 82% of prospective car buyers visited independent, third-party automotive websites in 2002, a figure similar to the 83% who did the same in 2001. In addition, J.D. Power finds that 76% of vehicle website users went to a manufacturer's website in 2002, up from 73% in 2001. The percentage of automotive internet users who visited dealer websites rose to 48% in 2002, which represents a 55% rise since 1999.

However, Cap Gemini Ernst & Young's "Cars Online 2002" report, a study of consumer car-buying habits and preferences around the world, offers a divergent conclusion. The eight-country survey, which polled 2,500 consumers in the US, UK, Germany, France, Italy, Sweden, Benelux and Japan, as well as 10 original equipment manufacturers (OEMs) and 100 dealers in each nation, found that 80% of buyers continue to rely on visits to traditional franchised dealers as their main source of automotive information, with the test drive still the most important factor in the buying process. Less than 20% cited the internet as their main source of information.

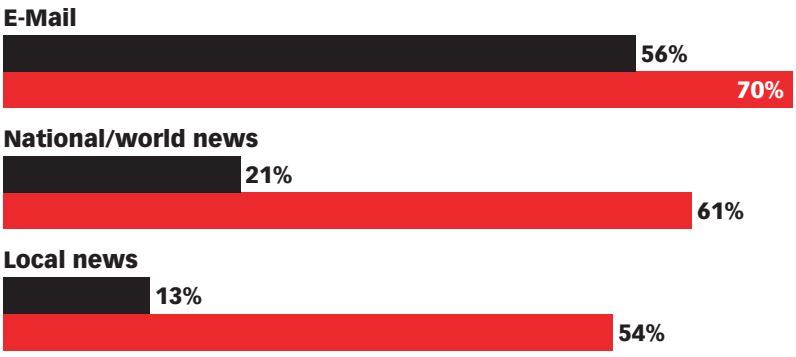
"Without question, manufacturers have redoubled their efforts and focus on online activity. They've made a quantum leap in the services they provide, and they also see now that the independent sites aren't going to monopolize this business."

– Scott Weitzman, senior director, J. D. Power and Associates, as quoted in the New York Times, 16 September 2002

On a more general note, a range of studies has shown that internet users in the US as well as in other countries around the world look to web for non-specific automotive information. In other words, enthusiasts who may not necessarily be in the market for a new vehicle but who like to follow trends or reviews of the latest models use the internet as another medium to follow their passion.

For example, MORI Research interviewed 2,000 US online consumers at the behest of the Newspaper Association of America (through a combination of online and telephone surveys) and found that 2% of US internet users go online every today to find some kind of automotive information.

Daily Online Activities of US Internet Users, 2002 (as a % of respondents)



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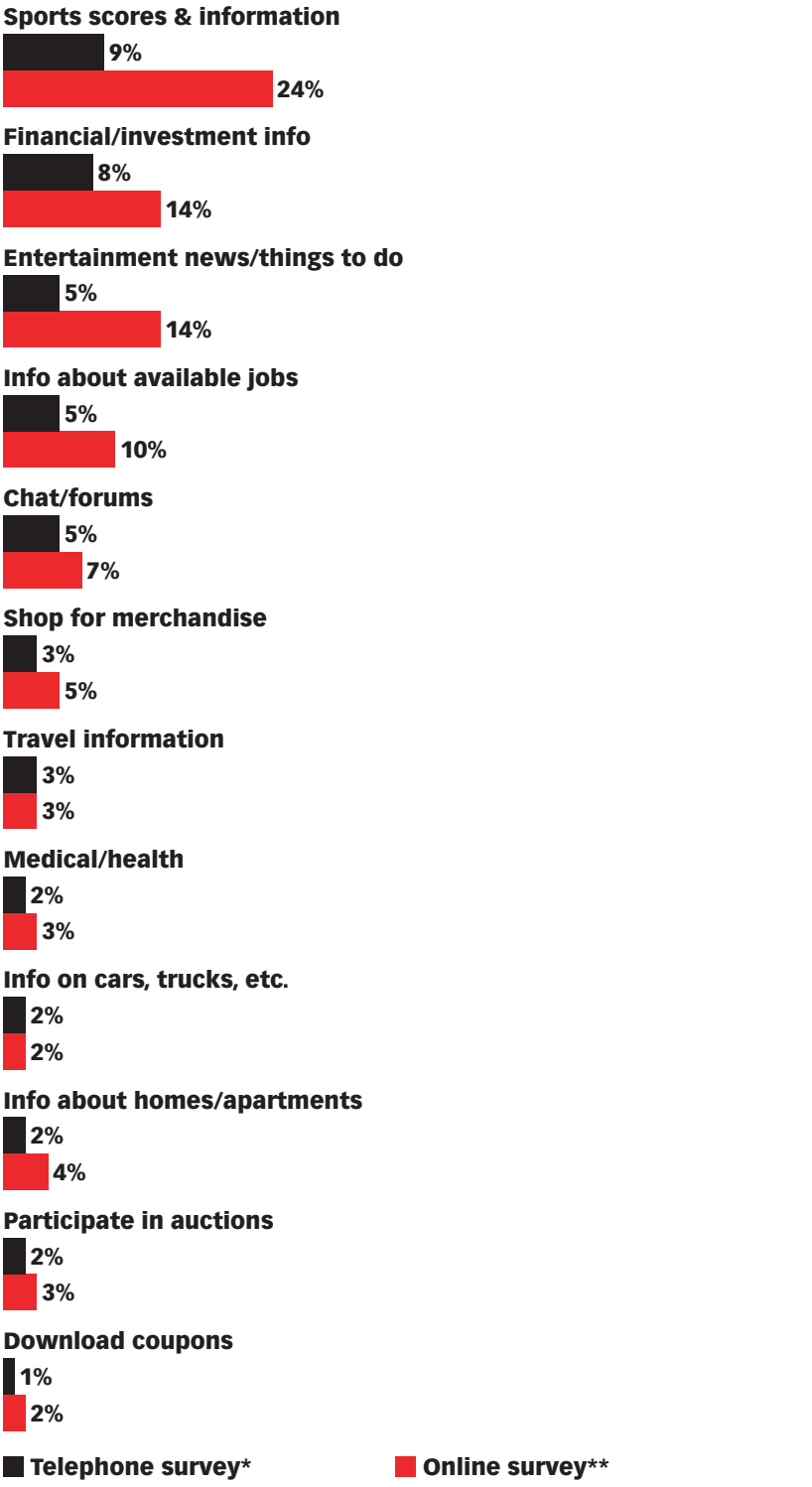

*Note: *n=2,000; **n=12,249*
Source: MORI Research commissioned by the Newspaper Association of America, May 2002

In the UK, an NFO WorldGroup study found that adults make fairly widespread use of the internet to get information on cars and motorcycles. However, magazines, newspapers and television remain more dominant channels, suggesting that at this stage, the internet is still a supplement, rather than a substitute, for traditional media.

Preferred Media British Adults Use for Information and Ideas on Topics in Which They Are Interested, November-December 2001 (as a % of respondents)

	Base	Magazines	Newspapers	Newspaper supplements	Television	Commercial radio	Websites
Beauty/ personal appearance	636	72%	10%	8%	26%	1%	6%
Fashion/ clothes	886	66%	13%	10%	27%	1%	9%
Celebrity news/ gossip	667	61%	37%	9%	43%	4%	7%
Cars and motorbikes	508	60%	30%	7%	25%	2%	21%
Baby/ childcare	398	56%	16%	11%	35%	2%	13%
Health and fitness	864	53%	19%	7%	25%	2%	21%
Photography	288	48%	14%	5%	20%	*	18%
Food and drink	1,330	46%	21%	14%	55%	2%	8%
Home improvement/DIY	980	43%	13%	9%	53%	2%	7%
Computers/ internet	709	43%	14%	6%	15%	1%	64%
Gardening	935	41%	16%	11%	61%	1%	5%
TV programs	1,539	40%	43%	18%	42%	1%	3%
Travel and holidays	1,210	32%	23%	14%	47%	2%	29%
Science/ technology	581	31%	24%	7%	51%	2%	34%
Sport	965	29%	44%	8%	66%	8%	15%
Music/ cinema/ theatre	1,434	27%	47%	12%	33%	12%	17%
Items for sale	588	26%	64%	8%	8%	1%	30%

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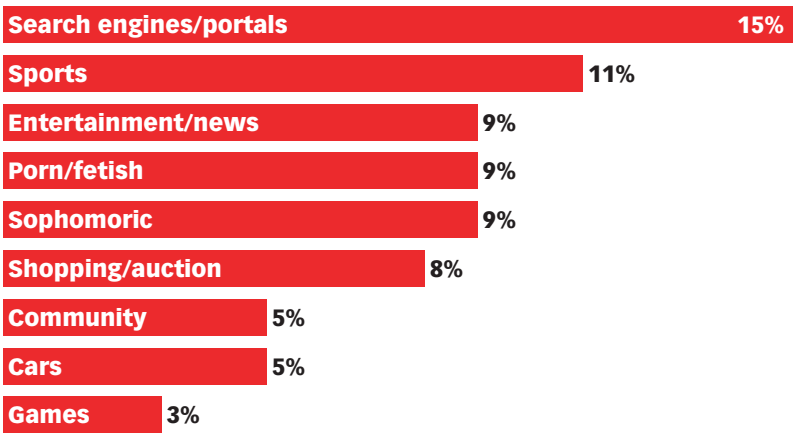
Personal finance/ investment	459	20%	54%	16%	19%	2%	30%
Business/ company news	337	19%	62%	12%	28%	4%	35%
Jobs/ appoint-ments	495	12%	70%	9%	5%	2%	37%

*Note: *less than 0.5%*
Source: NFO WorldGroup, April 2002

Finally, those concerned with marketing to specific niches would do well to heed the research of the Zandl Group. A July 2002 survey revealed automotive websites to be among the favorites of 18-to-24 year-old male consumers in the US. Toyota is one company that considers this market segment so important that it has developed an entirely new brand – Scion – with a distinct identity and new models just to target young male car buyers. Honda's newest vehicle, the modular Element, is likewise aimed squarely at this segment of first-time buyers.

Favorite Types of Websites among US Male Young Adults*, July 2002



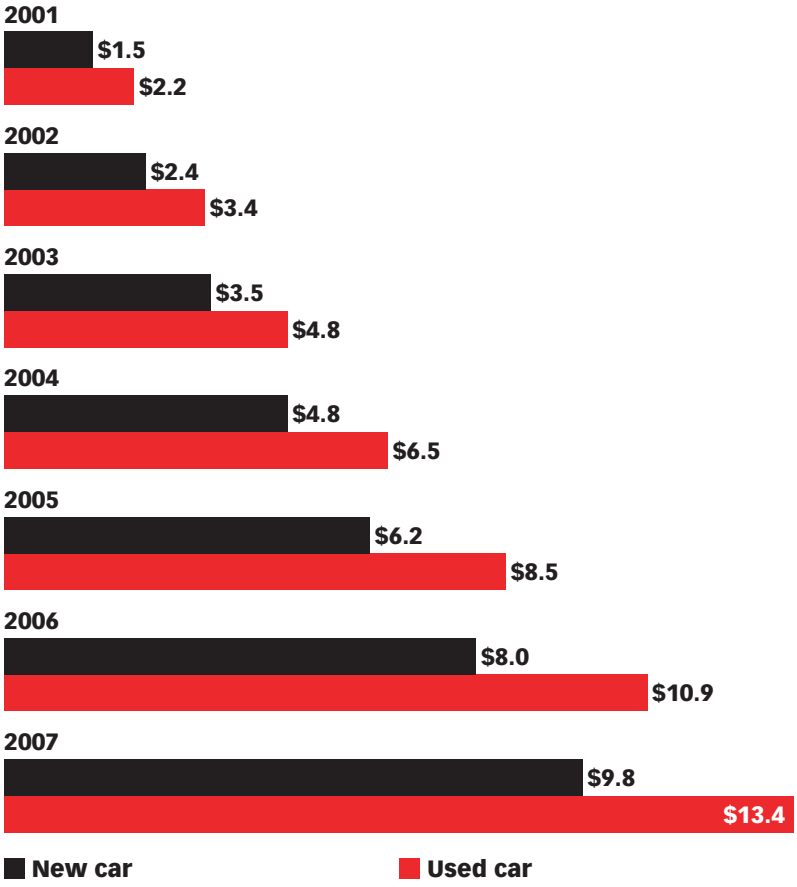
*Note: *ages 18-24*
Source: Zandl Group, July 2002

Financing and Insurance Information

Applying for Loans Online

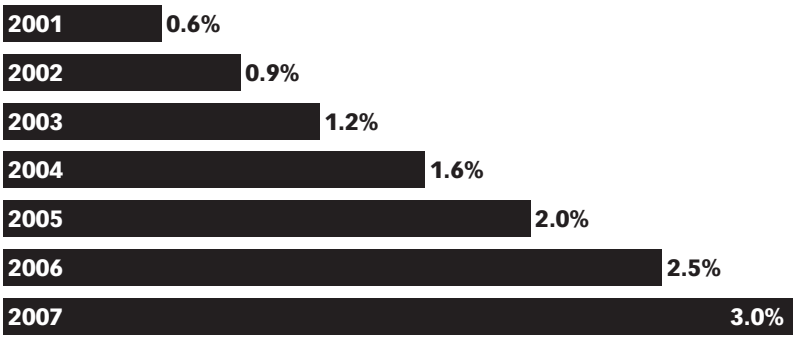
The percentage of consumers researching and applying for automotive loans online is still small, accounting for less than 1% of the total market, according to Jupiter Research's November 2002 "Automotive Lending" study. However, with the value of new and used car loans expected to increase more than four-fold between 2002 and 2007, the market bears watching.

US Online Auto Financing Loan Value, 2001-2007 (in billions)



Source: Jupiter Research, November 2002

US Online Auto Financing Loan Value, 2001-2007 (as a % of total auto financing)



Source: Jupiter Research, November 2002

"Lenders that provide improved service (i.e., making financial advisors available) to online customers and respond to inquiries quickly—within 24 hours—will differentiate themselves from the competition and decrease their overall cost of customer service."

– Jupiter Research, "Automotive Lending: Improve Online Offerings to Increase Effectiveness of Internet for Customer Acquisition" report, November 2002

Loan providers online and offline alike should take into account the fact that 38% of those US consumers surveyed by Jupiter who applied for auto loans over the web went online to investigate loan options. Younger consumers, as noted above, represent a key target market segment, because they are likely to research the entire vehicle purchase cycle (from model and dealer selection to financing and insurance) over the internet.

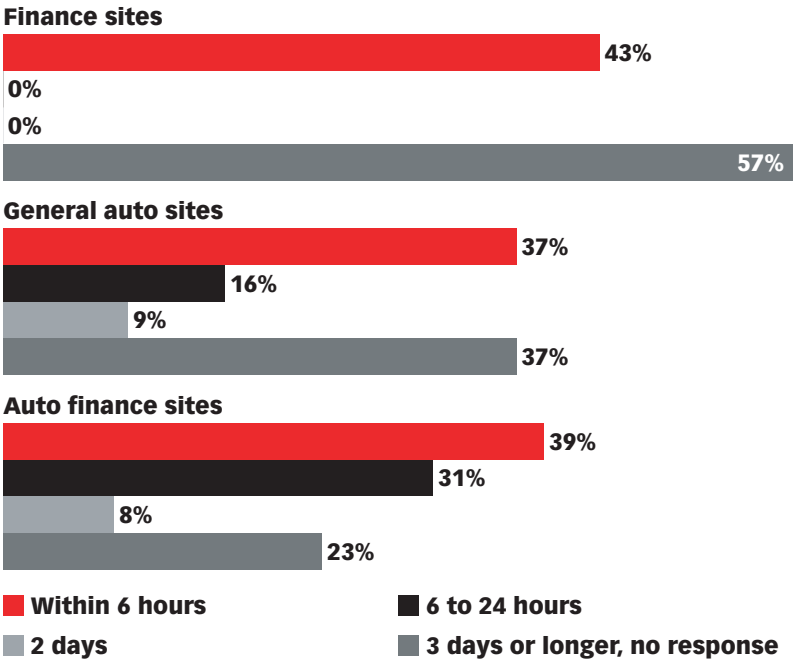
Internet-savvy consumers have high expectations that they will be able to accomplish most, if not all of the loan process online. According to Jupiter, the main reasons consumers apply for loans online are:

- speed up application and approval processes (52%)
- find better interest rates (27%)
- monitor application status (22%)

However, as of yet, just 8% of online loan sites offer consumers the ability to compare financing options and only 25% allow tracking of loan applications, suggesting areas that vendors could target for immediate improvements.

Finally, at the risk of beating a dead horse, it is worth reminding, per Jupiter's findings, that online automotive consumers expect a response to inquires within 24 hours, a benchmark 31% of auto finance sites failed to meet. The research firm observes that because most online loan vendors process applications in roughly the same amount of time, they must distinguish themselves by offering better customer service, for example, by providing online access to financial advisors – a feature few currently offer.

E-Mail Response Rates of US Automotive Sites, by Type of Site, July 2002 (as a % of sites surveyed)



Note: n=7 finance sites, 50 general auto sites and 13 auton finance sites
Source: Jupiter Research, July 2002

Getting an Insurance Quote Online

Like online car loan portals, insurance shopping websites are still in a relatively early phase of development and, as a result, leave much to be desired from the consumer's point of view. This was the conclusion reached by *Consumer Reports* magazine's Consumer WebWatch Team, which evaluated the top six automobile insurance websites in October 2002, finding all but InsWeb.com lacking in what it deemed essential features and functionality.

To come up with its results, the Consumer WebWatch Team counted the questions a prospective customer would have to answer and tested each site using a DSL connection (the times reflect those typical of a broadband connection; using dial-up service would undoubtedly result in a slower experience). On balance, InsWeb.com had the best combination of the criteria used to evaluate the insurance websites:

- Privacy and security (including transparent information-sharing policies)
- Customer service (including availability of around-the-clock telephone assistance)
- Disclosure (including readily accessible information about the company)
- Usability
- Content (including tools designed to educate consumers about the process of buying insurance)

Top Six Automobile Insurance Websites, by Type, October 2002

Independent marketplaces

	InsWeb.com	Insurance.com	Insure.com
Parent company	InsWeb Corp.	Fidelity Investments	Quote-smith.com
Sells policies online?	No	No	Yes
States directly covered by the site (of 51, including DC) excluding linked sites	51	19	1
Fastest quotes and method of delivery	Instantly online	Instantly online	Instantly online
Number of questions required for custom quote	109	122	99
Minutes to fill out application	14	23	10

Insurance companies

	Progressive.com	Esurance.com
Parent company	Progressive Insurance Corp.	White Mountains Insurance Group
Sells policies online?	Yes	Yes
States directly covered by the site (of 51, including DC) excluding linked sites	48	28
Fastest quotes and method of delivery	Instantly online	Instantly online
Number of questions required for custom quote	85	64
Minutes to fill out application	12	7

Agent referral sites

	NetQuote.com
Parent company	NetQuote
Sells policies online?	No
States directly covered by the site (of 51, including DC) excluding linked sites	51
Fastest quotes and method of delivery	Days, via e-mail or phone
Number of questions required for custom quote	83
Minutes to fill out application	10

Source: ConsumerReports.org, October 2002

B. Consumer Preferences

When consumers visit automotive sites, what are they looking for, aside from information? According to the Vividence Corporation, most of the factors affecting customer satisfaction would apply to any website: easy navigation, a cohesive layout, comprehensive information that can be easily scanned and searched, clear language, high-quality customer support and quick-loading pages.

Features Influencing US Online Customer Satisfaction While Visiting Automotive Websites, March 2002 (ranked by respondents)

1. Ease of use/navigation
2. Look and feel
3. Layout/organization
4. Variety of tools available (e.g., customize a vehicle to your specifications)
5. Comprehensiveness of information
6. Detailed specifications about different models
7. Quality of photos/360-degree views
8. Ease of reading/scanning information
9. Availability of search tool
10. Clarity of terminology and language
11. Availability of online help and customer service
12. Speed of site (i.e., quick loading pages)

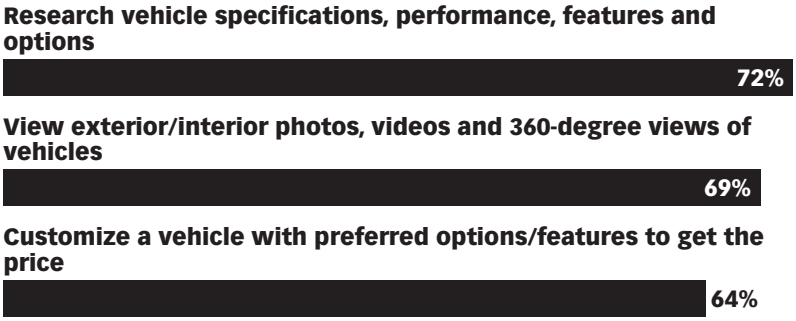
Source: Vividence Corporation, June 2002

 www.eMarketer.com

The Vividence study found that the majority of car shoppers (58% of those surveyed) start their online research at OEM sites, compared to 39% who begin at third-party sites such as Kelley Blue Book or MSN Autos. It also makes clear that manufacturer and third-party websites present different value propositions for car shoppers.

For example, prospective buyers prefer to research vehicle specifications, view photos and take 360-degree tours of the interiors and exteriors of different models on manufacturer websites, even though many third-party websites also offer these features. Specifically, Vividence research suggests that consumers believe OEMs have the most up-to-date information about the models they are selling. In other words, consumers view the provision of information about vehicle specifications to be the auto manufacturers' core competency.

Reasons US Online Consumers Visit Automakers' Websites When Shopping for a Vehicle, March 2002 (as a % of respondents)



Source: Vividence Corporation, June 2002

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However, car shoppers prefer to compare similar vehicles at independent websites, even though most OEM sites offer vehicle comparison features (usually in conjunction with an third party such as Automotive Information Center [AIC]). Although 54% of the online consumers surveyed by Vividence said they would do comparisons on a manufacturer website, 33% said they would do so *only* on an independent site, primarily because they viewed third-party sites as objective. Vehicle reviews are another attraction of third-party auto sites.

Reasons US Online Consumers Visit Independent Third-Party Websites When Shopping for a Vehicle, March 2002 (as a % of respondents)

Source: Vividence Corporation, June 2002

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Another interesting finding of the Vividence study has to do with the long-range planning of prospective car buyers. Many, in fact, begin their research process well in advance:

- 50% of those planning to buy in six to 12 months have already started to research vehicle preferences
- 32% of those who do not expect to buy for more than one year have likewise begun to gather information

Forrester Research, on the other hand, believes that the research-to-purchase timeframe is shorter. It estimates that approximately one in four visitors to an automotive website buys a vehicle within three months. In its February 2002 "Carbuyers' Paths to Purchase" report, Forrester states that 64% of consumers do all of their online research in five or fewer visits to an automotive website, with repeat visits a relative rarity.

"Common assumptions about customer behavior when shopping for vehicles online are wrong. For example, loyalty and repeat visits are actually an anti-predictor of purchase. Most people who buy come in short, intense bursts, and don't hang out on auto sites."

– Mark Dixon Bünger, senior analyst, Forrester Research, 19 February 2002

Overall, ease of use figures strongly in the satisfaction consumers derive from using automotive websites, particularly where dealing with 360-degree tours and vehicle customization and comparison features are concerned. Whereas most of the consumers surveyed by Vividence had success in customizing a vehicle to their specifications, a relatively high percentage (54%) found the comparison tool to be frustrating, difficult to find or inadequate for making direct comparisons with another vehicle.

Many also experienced difficulties in using the 360-degree views of vehicle interiors and exteriors as well as in viewing static photos or streaming videos. Among the most common problems were:

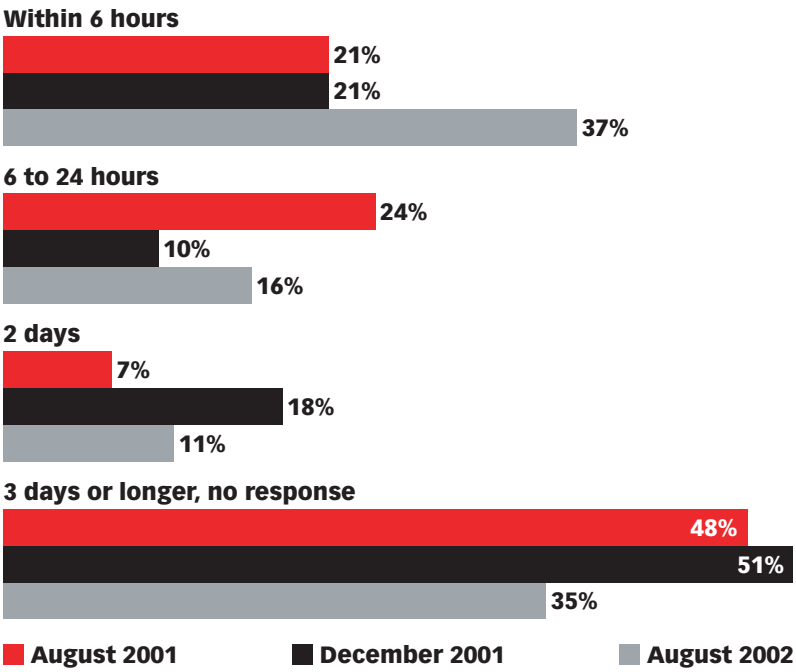
- Need to download special software
- Length of time for images or videos to load
- Inability to view all the angles or views in a given vehicle

Finally, as noted in the previous chapter, consumers expect good service, and those expectations rise in accordance with the sticker price of the vehicle they are considering. A baseline expectation is an e-mail response within a 24-hour timeframe to a query submitted online. In descending order, the 24-hour response rates of buying, content, finance and OEM websites were as follows:

- Content – 86%
- Buying – 63%
- OEM – 44%
- Finance and insurance – 33%

According to Jupiter Research, the response times of automotive websites in the aggregate (including from all four of the above categories) have been dropping over the past year and a half.

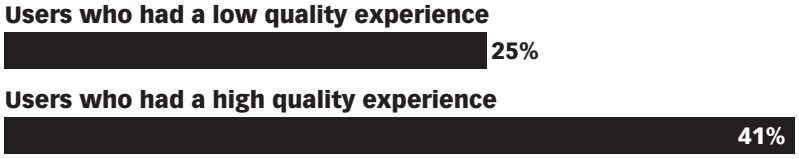
E-Mail Response Rates of US Automotive Sites, 2001-2002 (as a % of sites surveyed)



Source: Jupiter Research, October 2002

The results of the Vividence study suggest that failure to heed consumer concerns could prove highly detrimental, given that the experience users have at an automaker's site play an integral role in the decision-making process. The study determined that 41% of people who had a high quality online experience were likely to buy a car from the automaker, while only 25% of those who had a low quality online experience were likely to buy from the relevant automaker. Furthermore, after a low quality online experience, prospective buyers were 31% *less likely* to purchase a vehicle from the manufacturer. For the purposes of the study, overall satisfaction scores in the top 25% of all survey participants were considered high quality experiences and scores in the bottom 25% were categorized as low quality.

Percent of US Online Consumers Who Are More Likely to Purchase a Vehicle after Visiting Automaker's Website, March 2002



Source: Vividence Corporation, June 2002

C. Leading Automotive Websites

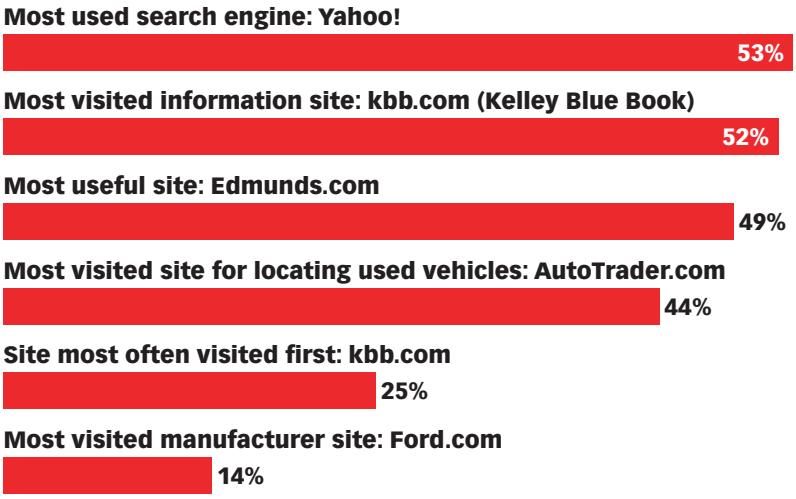
Although the internet abounds with websites offering information about vehicles, new and used, as well as related issues such as financing and insurance, the landscape is a bit reminiscent of the online travel marketplace in that consumers may not be able to find *all* the information or features they are seeking on a single site. Consequently, the truly diligent car buyer may find him- or herself surfing through a range of sites in order to get the complete picture. While having more than one perspective may aid in the buying process, it is also time consuming.

Not surprisingly, with the online marketplace littered with automotive websites, competition is fierce. Sites like MSN Autos (formerly Carpoint) have been striving to differentiate themselves by offering value-added features, such as the recently added real-time traffic alerts. Cars.com, a property of several media companies, including the *New York Times*, aims to add a real-time dealer inventory to better assist in internet-generated sales leads.

US

The roster of leading automotive websites has remained fairly consistent over the past couple of years. The search engine Yahoo! was the leader in that category in 2001, according to a J. D. Power study of used car buyers who used the internet at some point in the purchase process. In other words, it was a starting point for a large portion of car buyers looking to research brand, model and other vehicle data online. The website of the oft-consulted Kelley Blue Book, which maintains benchmark pricing data for both used and now new cars, was a trusted go-to resource for car-buying consumers in 2001.

Top Automotive Internet Sites among Automotive Internet Users*, 2001 (as a % of respondents)



*Note: *used-vehicle buyers who use the internet in any way as part of the shopping process*
Source: J.D. Power and Associates, 2001

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According to Nielsen//NetRatings audience measurement findings, Kelley Blue Book, AutoTrader.com and Edmunds.com continued as the leading resources in early 2002. The eBay Motors website was launched and initially functioned in partnership with AutoTrader, however AutoTrader has announced plans to roll out its own online auction service, which would compete directly with eBay Motors. MSN Carpoint, now known as MSN Autos, is a comprehensive content site, with information on new and used vehicles as well as financing and insurance.

Top Automotive Websites among At-Home and At-Work Internet Users in the US, February 2002

	Unique audience (in thousands)	Time per person (h:mm:ss)
1. Kelley Blue Book	3,901	0:10:41
2. eBay Motors	2,790	0:17:37
3. AutoTrader.com	2,589	0:21:13
4. MSN Carpoint	2,488	0:09:38
5. Edmunds.com	2,380	0:11:13

Source: Nielsen//NetRatings, March 2002

Europe

According to the August 2002 edition of *Blink*, the e-mail newsletter of research firm NetValue, popular automotive websites in June 2002 in Europe included manufacturers' sites as well as third-party content and service sites. On the whole, however, the reach of most of these sites is still modest in comparison to the leaders in the banking sector, which, in countries like Sweden, enjoy a 25% penetration among at-home internet users.

Top Automotive Websites among At-Home Internet Users in Selected European Countries, June 2002

	Domain	Reach
Denmark	fdm.dk	3.8%
	bilinfo.dk	2.9%
	bilbasen.dk	2.6%
	peugeot.dk	1.7%
	bilfo.dk	1.5%
France	renault.fr	2.3%
	michelin.fr	2.2%
	caradisiac.com	1.8%
	argusauto.com	1.8%

continued on page 103

	peugeot.fr	1.2%
Germany	mobile.de	6.0%
	adac.de	4.5%
	autoscout24.de	3.3%
	volkswagen.de	2.5%
	bmw.de	1.7%
Italy	genialpoint.it	1.1%
	trovaetrova.com	1.0%
	inauto.com	0.8%
	motonline.com	0.8%
	aci.it	0.5%
Norway	naf.no	1.9%
	bilguiden.no	1.6%
	bilnorge.no	1.3%
	autodb.com	1.2%
	autos.no	1.2%
Spain	autocity.com	4.7%
	movendus.com	3.0%
	ford.es	1.2%
	autoscout24.es	1.1%
Sweden	bytbil.com	2.9%
	autobytel.se	2.5%
UK	theaa.co.uk	4.2%
	autotrader.co.uk	3.2%
	rac.co.uk	2.5%
	dvla-som.co.uk	1.1%
	halfords.com	1.0%

Note: reach denotes the percentage of at-home internet users who visited the site at least once during the month
Source: NetValue, August 2002

"For European car manufacturers, customer relationships largely end once a sale is made, so they are failing to realise the obvious brand and repeat sales benefits of longer term customer contact. Car manufacturers must leverage their own brand by using in-car technology, mobile phones and the Internet to develop exclusive hybrid services and build ongoing customer relationships."

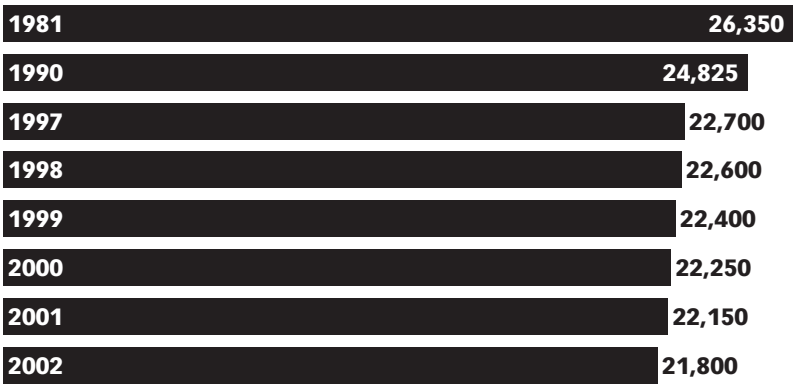
– Michael Dornan, automotive analyst, GartnerG2, 12 October 2001

Proponents of the internet, swept up in the heady fever of the late 1990s, were heard to predict that people would no longer need to go to car dealers to purchase vehicles and would instead buy them from inside the comfort of their own homes, thus eliminating a series of intermediaries. However, as with so many aspects of the internet, the pundits were, at worst, totally off base, and at best, guilty of having a hyperactive imagination.

Complete disintermediation was not possible across much of the US simply because state franchise laws typically support the continued existence of traditional dealerships on the grounds that they are an economically vital facet of any state's economy, while newcomers, such as online automotive retailers or brokers, operate under varying degrees of restrictions. Manufacturers, who have experimented with direct internet sales to consumers, still rely on their dealer networks to perform services that do not fall within their core competencies.

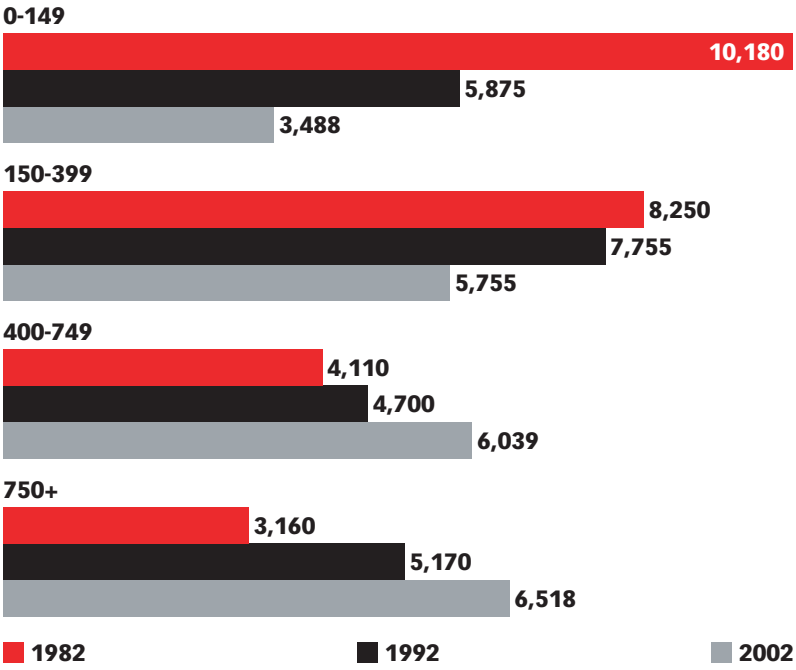
According to the National Automobile Dealers Association (NADA), the net count fell by 350 dealers from 2001 to 2002, the largest such drop since 1993. At the same time, NADA's annual "NADA Data" report, published in May 2002, observed that small-volume dealerships have experienced the biggest decline in numbers over the past 20 years, in contrast to the steep rise in large, higher-volume dealer groups.

New-Car Dealerships in the US, 1981, 1990, 1997-2002



Note: as of 1 January for each year
Source: National Automobile Dealers Association (NADA), May 2002

New-Car Dealerships in the US, by Volume of Annual New-Unit Sales, 1982, 1992 & 2002



Source: National Automobile Dealers Association (NADA), May 2002

The declining number of dealerships in the US has not been accompanied by a decline in total sales or profit for the average dealer, thanks in part to a steady rise in the average selling price of both new and used cars. The table below, which provides a profile of an average US dealership, shows that dealer sales and pretax profits reached record levels in 2001, despite a weakening economy.

Profile of Average US Auto Dealership, 1996-2001

	1996	1997	1998	1999	2000	2001
New-car sales (in millions)	$12.5	$13.1	$14.4	$16.3	$17.6	$18.8
As a % of total sales	57.7%	58.6%	59.0%	59.9%	60.1%	59.4%
Used-car sales (in millions)	$6.6	$6.5	$7.2	$7.9	$8.4	$9.2
As a % of total sales	30.4%	29.0%	29.4%	28.9%	28.6%	29.0%
Service and parts sales (in millions)	$2.6	$2.8	$2.8	$3.0	$3.3	$3.7
As a % of total sales	11.9%	12.4%	11.6%	11.2%	11.4%	11.6%
Total sales (in millions)	**$21.6**	**$22.4**	**$24.5**	**$27.3**	**$29.4**	**$31.7**
Net pretax profit	$330,546	$306,980	$415,549	$498,719	$455,924	$618,974
Average new-car selling price	$21,900	$22,650	$23,600	$24,445	$24,923	$25,797
Average used-car selling price	$11,850	$12,100	$12,500	$13,236	$13,648	$13,930

Note: numbers may not add to total due to rounding
Source: National Automobile Dealers Association (NADA), May 2002

A. Impact of the Internet on Dealers and Sales Process

Dealers, although decreased in number as part of a long-term trend, remain a vital link in the sales chain, and most car buyers, even if armed with model and pricing information from the internet, still make the pilgrimage to the local dealership to test drive and ultimately pick up their vehicle of choice (and return regularly for service and parts).

According to Cap Gemini Ernst & Young's "Cars Online 2002" report, which surveyed 100 dealers in each of the following countries – US, UK, Germany, France, Italy, Sweden, Benelux and Japan – dealers have begun to reconsider the impact of the internet on their businesses. In the 2001 "Cars Online" report, 53% of the dealers surveyed said they expected the overall number of dealerships would decline as a result of the internet, with only 14% anticipating growth. One year later, dealerships were far more optimistic, with only 30% anticipating decline and 37% predicting future growth in their ranks. A smaller percentage also anticipated a rise in alternative automotive retail outlets, such as supermarkets (45% in 2002 versus 51% in 2001). Overall, the majority of the dealers surveyed by Cap Gemini Ernst & Young (CGEY) believes the internet will be a benefit to their operations. European dealers have separate issues to deal with in terms of modifications to the Block Exemption agreement, which regulates new car sales and service, but they, too, believe that on balance, their business as a whole will not suffer in the near term.

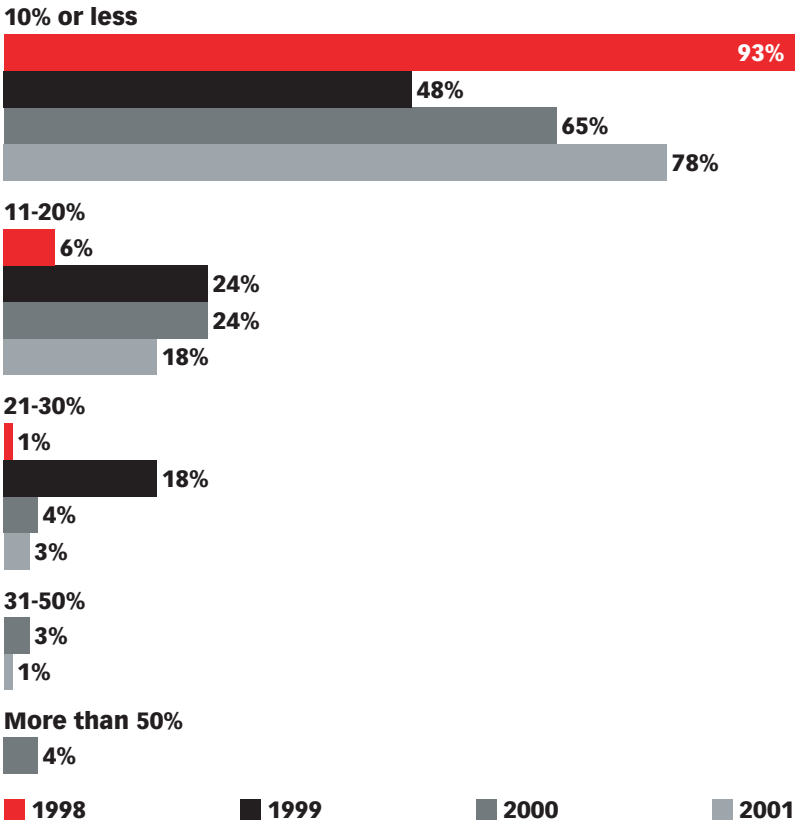
"Most dealers believe the customer will become ever more knowledgeable, resulting in increased competition. Many also believe that test drives, dealer/prospect rations as well as the size of discounts and the frequency with which they are given will increase."

– Cap Gemini Ernst & Young (CGEY), "Cars Online 2002" report

When considering the US alone, the situation from dealers' perspective, is a bit more ambiguous. While dealers surveyed as part of EDS' "4th Annual Dealer Attitudinal IT Study" have noted an increasing "preparedness" on the part of consumers, 96% said that the internet generates a maximum of 20% of their sales leads.

Note that EDS interviewed a total of 100 dealer principals, representing small, medium-size, large and mega dealerships. A sampling of all major manufacturers was included in the survey.

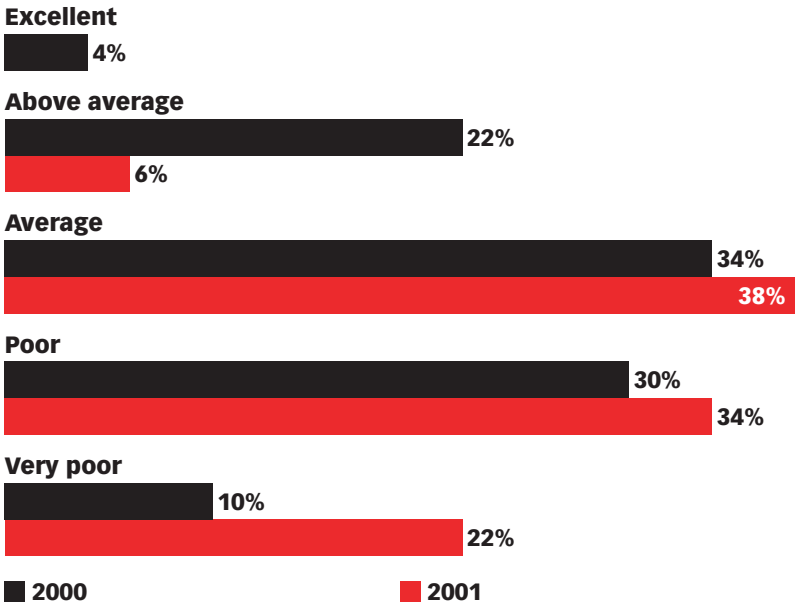
Sales Leads of US Auto Dealers Generated via the Internet, 1998-2001 (as a % of total)



Note: n=100
Source: EDS, March 2002

Moreover, dealers perceive a drop in the quality of sales leads that come from the web. Many believe that they are getting the same information from multiple sources, because a range of automotive websites may lead the consumer to the same dealer in his or her area.

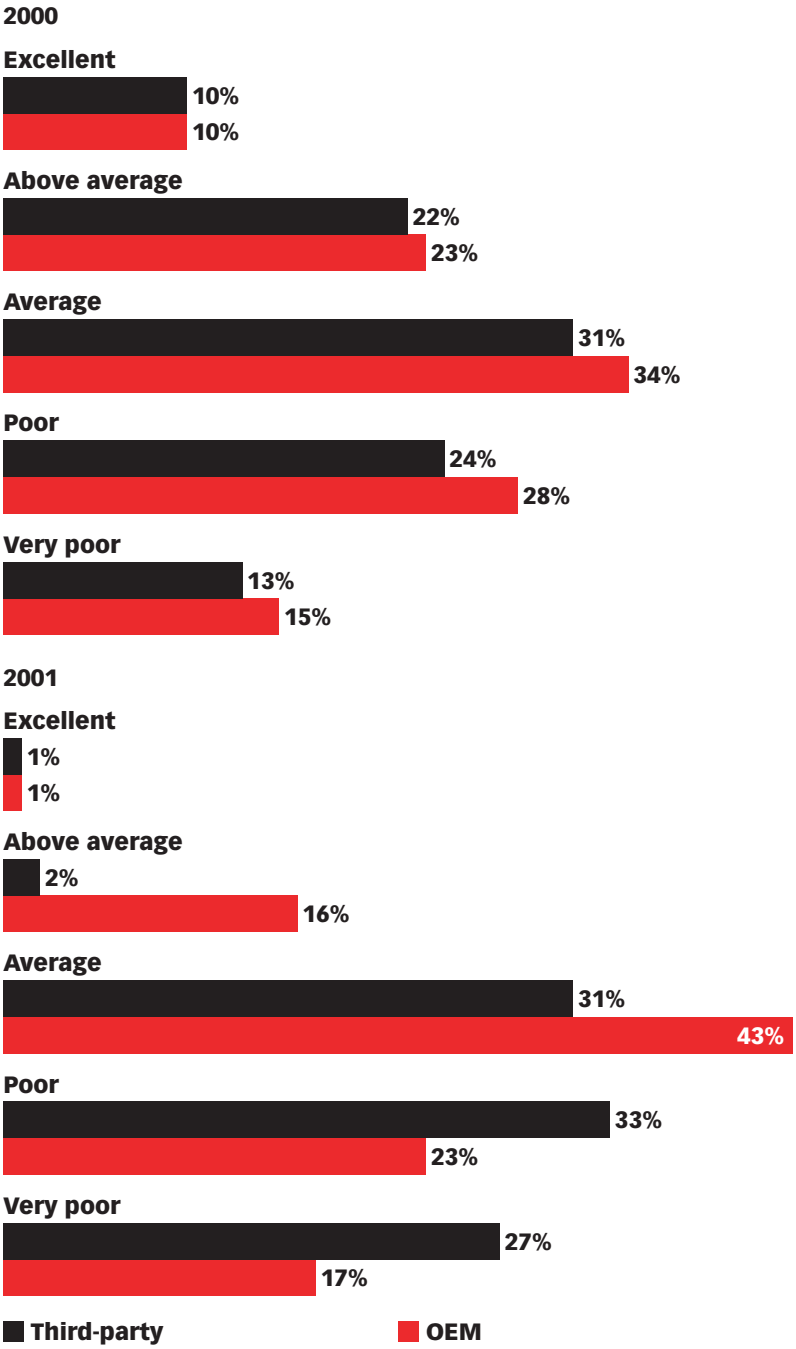
Perceived Quality of US Auto Dealer Sales Leads Generated via the Internet, 2000 & 2001 (as a % of respondents)



Note: n=100
Source: EDS, March 2002

However, the survey findings do point to a difference in the quality of leads coming from third-party automotive websites versus those from OEM sites. EDS believes that the dealers will continue to reduce their involvement with third-party sites and focus on manufacturer-driven channels such as GM BuyPower and FordDirect. Only 35% of dealers made use of lead broker services in 2001, down from 54% in 1999, according to figures cited by EDS.

Perceived Quality of US Auto Dealer Sales Leads Generated via the Internet by Third-Party and OEM Automotive Websites, 2000 & 2001 (as a % of respondents)



Note: n=100
Source: EDS, March 2002

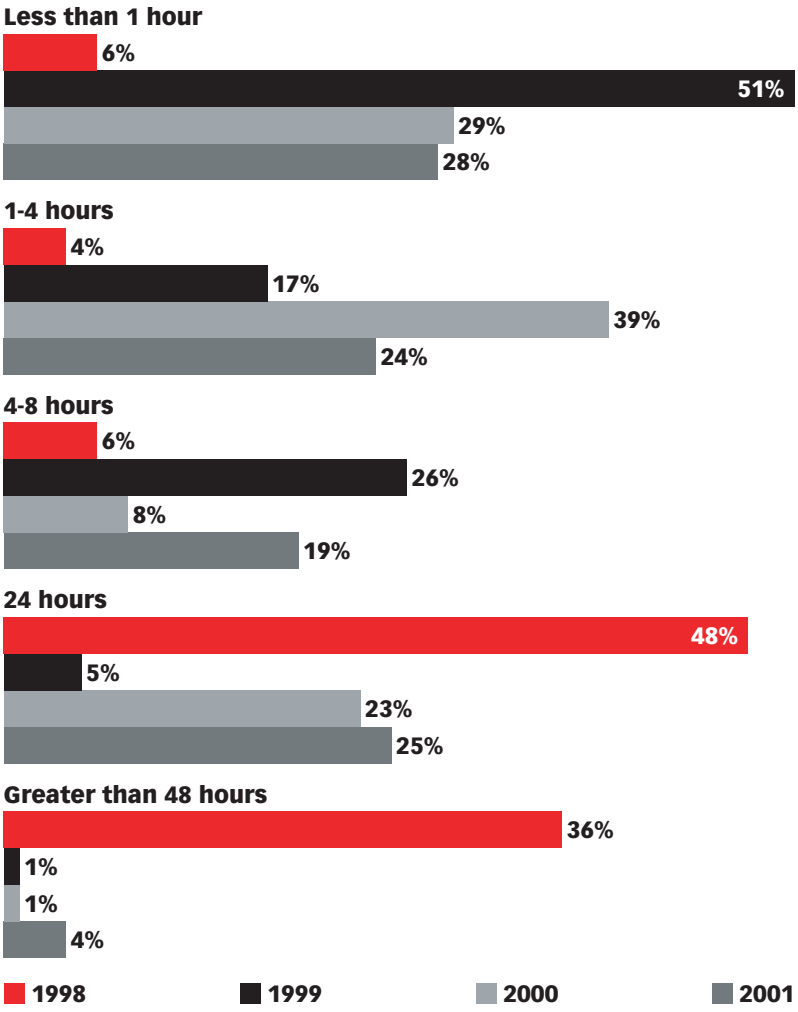
"A consensus is building among dealers that leads from factory sites are clearly of a higher quality than those sold by third-party web brokers."

– Spencer Hondros, chairman, General Motors Dealer Information Technology Advisory Board, as quoted in the "Center Stage in the Future of Automotive Retailing: Information Technology and the Internet" report by EDS, Winter 2002

Given dealers' relatively ambivalent opinions about the quality and quantity of business they derive from the internet, it is not surprising that response times to online customer inquiries have been worsening. While 68% said they responded in four or fewer hours in 2000, the figure dropped to 52% in 2001. In that same period, the percentage of dealers needing more than 48 hours to responded quadrupled from 1% to 4%.

However, among the small portion of dealers that did respond to customer queries in less than one hour, service has actually been steadily improving, with 92% stating that they are able to respond in less than 30 minutes (versus 89% in 2000 and 76% in 1999). This 28% of dealers clearly represents the vanguard that has adopted the internet wholeheartedly, and the likelihood is that they will continue to improve service to the online channel.

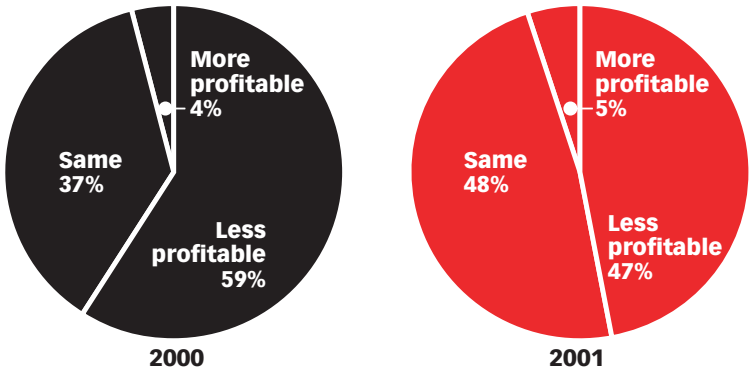
Response Times to Internet Inquiries among US Auto Dealers, 1998-2001 (as a % of respondents)



Note: n=100
Source: EDS, March 2002

Overall, the relative indifference most dealers have shown to the internet is curious given that according to EDS, most (53%) see sales affected in some way by the internet to be at least as profitable as those by traditional means. This also suggests that while savvy consumers have used the internet to thoroughly research vehicle and pricing options, they are still willing to pay for the kinds of value-added services that only dealers can offer.

Profitability of Internet-Generated Auto Sales versus Traditional Auto Sales in the US, 2000 2001 (as a % of respondents)

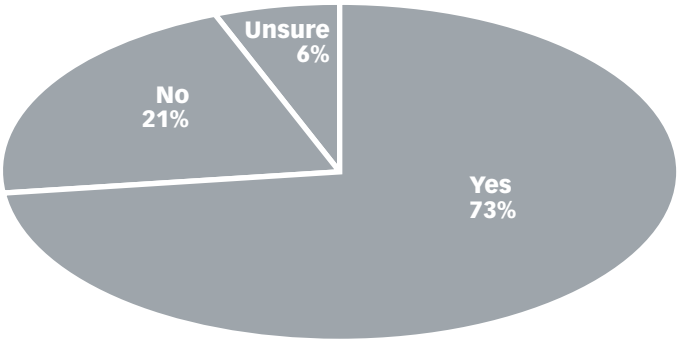


Note: n=100
Source: EDS, March 2002

Increasingly, dealers in the US are using electronic customer relationship management (eCRM) solutions to manage the steep increase in internet-based inquiries. According to EDS, 73% of dealers surveyed said that they have implemented and are using an eCRM solution to better manage the increased need for customer contact, particularly as the number of large dealer groups continues to grow.

Moreover, more than half of dealers are satisfied or very satisfied with the eCRM systems they have in place. Only 26% declared themselves to be at least somewhat dissatisfied.

Utilization of eCRM Solutions by US Auto Dealers, 2001 (as a % of respondents)



Note: n=100
Source: EDS, March 2002

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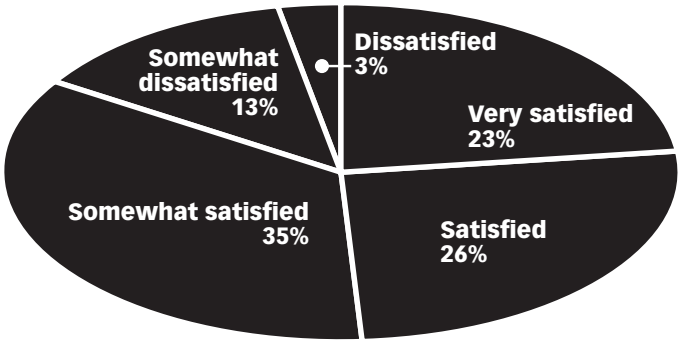
US Auto Dealer Overall Satisfaction with eCRM Solutions, 2001 (as a % of respondents)



Source: EDS, March 2002

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"In some ways, I think the manufacturers may be losing their way when it comes to trying to sell cars online. They're groping around for the right strategy, and it's tough to come up with, in part because I think selling cars is not their strong suit; manufacturing and marketing cars is."

– Jonathan Gaw, analyst, IDC, 8 March 200110

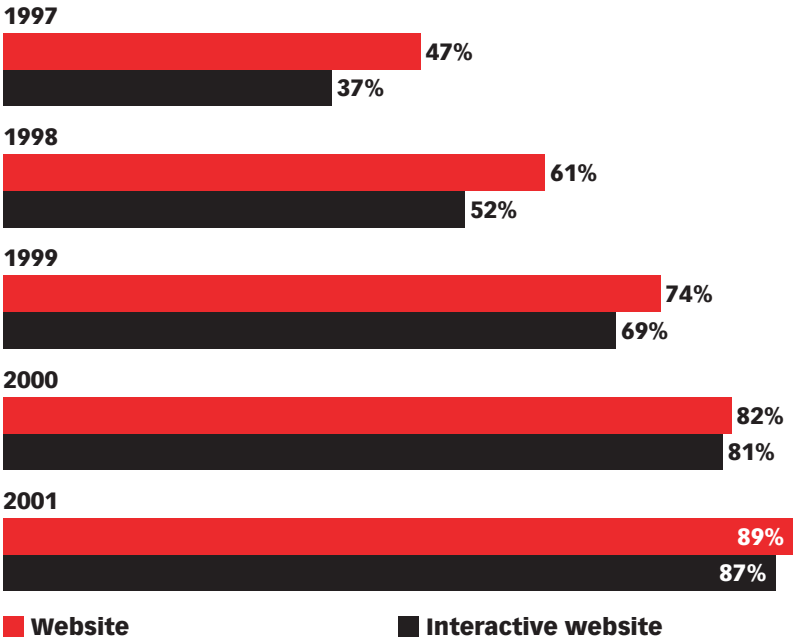
B. Dealer Website and IT Capabilities

Emphasis on Expanding Website Features

Although dealers, as seen in the preceding section, are as yet uncertain what return they are getting from the internet, they have not shied away from the web. According to NADA figures, almost 90% had a website at the end of 2001, nearly double the share in 1997, and around 97% had dedicated staff in charge of monitoring and performing upkeep on the website.

Not surprisingly, NADA data also suggests that those dealerships with a longer web presence have been more successful at driving online sales. Dealers that have had a website since 1995 generate an average of 13 new-car sales per month online, while those online for two years average just five web-based sales per month (the same pattern does not necessarily hold for used-car sales, however).

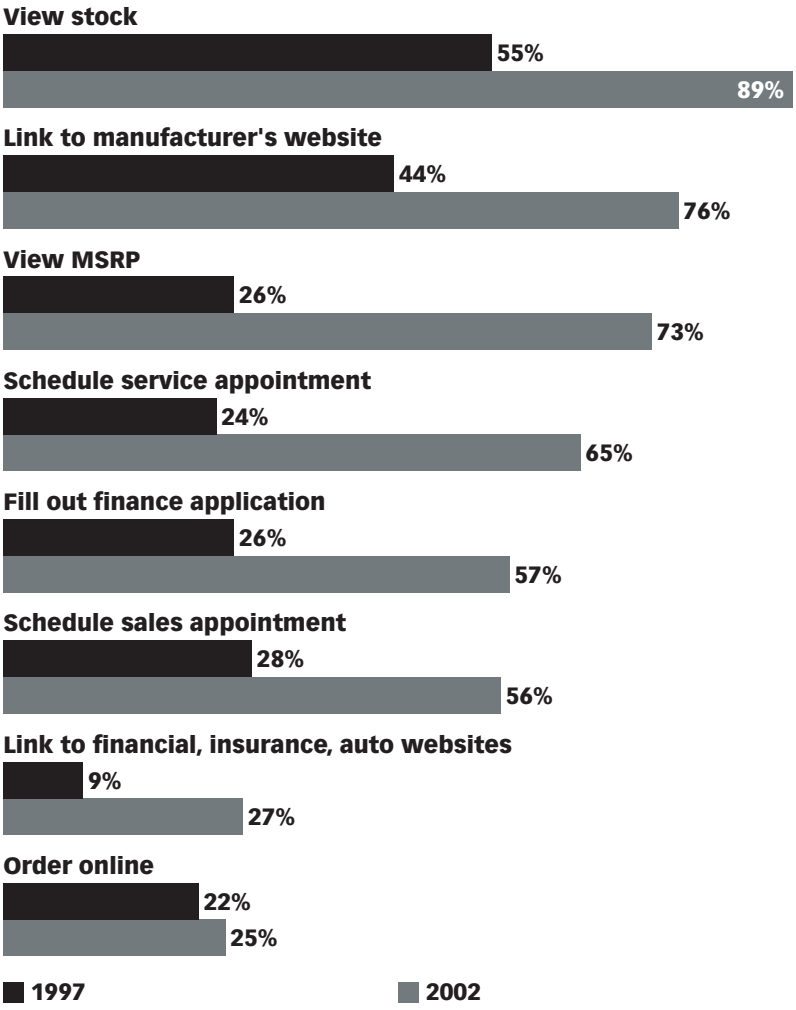
Percent of US Auto Dealerships with a Website, 1997-2001



Source: National Automobile Dealers Association (NADA), September 2002

With 87% of dealer websites offering interactive features, it is clear that dealers have understood the importance of offering prospective buyers a range on information, including key real-time inventory data. Many are also using their websites to schedule customer sales visits or revenue-generating service appointments.

Percent of US Auto Dealership Websites Offering Selected Online Features, 1997 vs. 2002



Source: National Automobile Dealers Association (NADA), September 2002

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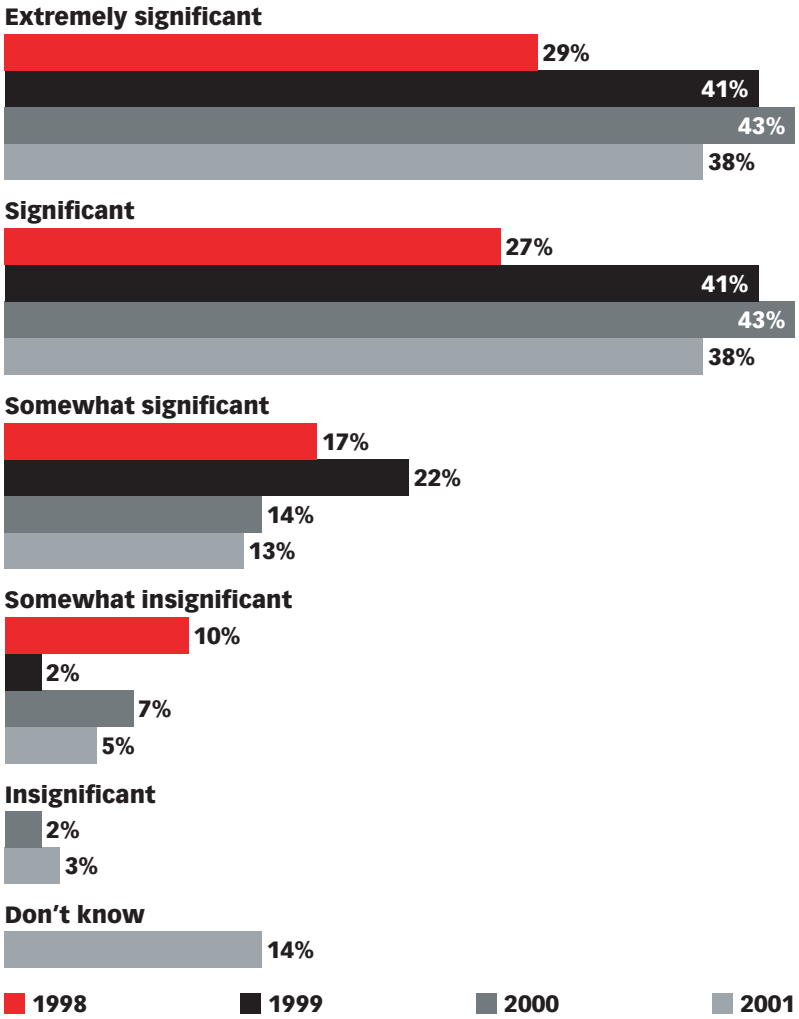
"Our systems can't talk to each other. We can't share data. It's a hindrance and we can be much more effective."

–Wes Lutz, chairman, NADA IT Committee, as quoted in the "Center Stage in the Future of Automotive Retailing: Information Technology and the Internet" report by EDS, Winter 2002

IT Capabilities Provide Competitive Edge

Like many other businesses, auto dealers have been placing an increasing emphasis on enhancing their IT capabilities as a means of maintaining an edge in the increasing competitive vehicle marketplace. According to EDS findings, 82% of dealers see effective use of IT as a key to success in the next three to five years.

Significance of IT Capability for US Auto Dealer Competitiveness in the Next 3-5 Years, 1998-2001 (as a % of respondents)

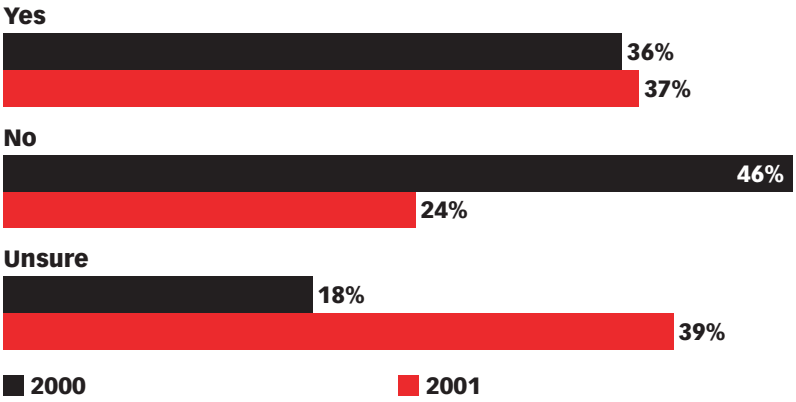


Note: n=100
Source: EDS, March 2002

The debate about whether to employ application service provider (ASP) solutions among auto dealers continues. In the main, the dealers surveyed by EDS prefer not to use ASPs, but many are unsure. Dealers are united, however, in their belief that web-based solutions should cost them the same if not less than their existing platforms.

One aspect to consider on this point is that EDS itself provides ASP solutions to the auto industry. As such, it has a greater stake in influencing the outcome of this particular issue.

US Auto Dealers' Preference for Migrating Management Systems to the Web, 2000 & 2001 (as a % of respondents)



Note: n=100
Source: EDS, March 2002

"Dealers who ignore the impact and significant of IT are not likely to survive in the 21st century."

– Matt Parsons, vice president of marketing and business development, EDS Automotive Retail Group, 19 March 2002

As with other parts of their organizations, automotive manufacturers have begun to use the internet as a means of streamlining procurement processes. This effort has now spread to automakers' dealer networks as well. In June 2002, General Motors (GM) unveiled an online procurement marketplace for its 7,500 dealers where they are now able to purchase supplies ranging from office furniture to gasoline. For access to the portal, which is hosted by Covisint and Reynolds & Reynolds, GM charges $360 per year, although dealers reap significant discounts on supplies by using the marketplace (such as a five-cent per gallon discount on gasoline). The automaker believes that its dealers, which spend approximately $1 billion annually on procurement, could save up to 15% on materials and supplies.

A. Online Retail Sales by Product Category

Online retail sales are expected to see continued steady growth over the next several years, as the internet takes its place among established store- and catalog-based shopping channels. However, it is important to remember that the internet as a retail channel is still at an early stage of its growth, with online sales accounting for no more than 1.5% of all US retail sales as of the second quarter of 2002. Forrester Research predicts that online retail sales will account for 8% of all retail sales by 2007. eMarketer estimates that online consumer sales, including travel and motor vehicles (new and used), parts and accessories, swelled to $64.7 billion in 2002, growing steadily from $53.1 billion in 2001 and $40.7 billion in 2000.

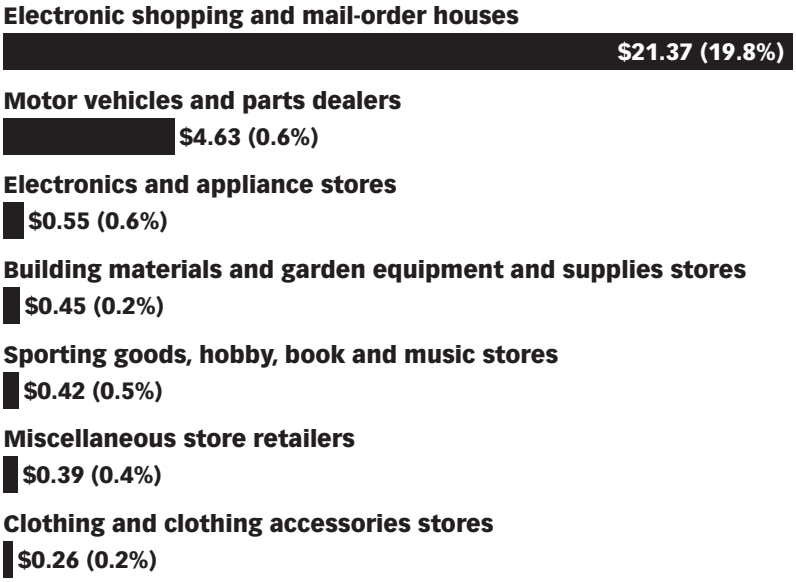
US Online Retail and Leisure Travel Revenues, 2000-2002 (in billions)

	2000	2001	2002
Online retail sales*	$27.3	$35.9	$44.1
Online travel	$13.4	$17.2	$20.6
Total B2C revenues	**$40.7**	**$53.1**	**$64.7**

*Note: *eMarketer's year 2000 and 2001 baselines for retail sales are derived from US Department of Commerce figures, with an estimate made for Q4 2001 travel; 2001 figure includes DOC revised estimate for Q4 2001*
Source: eMarketer, September 2002

In the spring of 2002, the US Census Bureau released data from its 2000 Annual Retail Trade Survey, providing a more thorough breakdown of online retail sales by merchant category. Not surprisingly, the study found that electronic shopping and mail-order companies saw an average 19.8% of their revenues come from internet-based sales, while most other retailers received no more than 1% of their revenues through online sales channels. However, it is significant to note that car and parts dealers were the second highest category, albeit at a distant 0.6%.

US Retailers' Online Sales, by Merchant Category, 2000 (in billions and as a % of total category sales)



Source: US Census Bureau, April 2002

In another broad look at online retail sales across all merchant categories, Shop.org and the Boston Consulting Group have projected that online automotive sales would grow by 66.7% in 2002 to reach $9.0 billion by the end of the year, making automotive the second largest category online after travel. Online retail revenues for the automotive industry posted the highest growth of any category from 2000 to 2001. Note that revenue projections include parts sales as well as internet referrals for vehicle sales completed offline.

Online Retail Revenues in the US, by Category, 2001 & 2002 (in billions and as a % growth)

	2001 actual	2002 projected	2000-2001 growth	2001-2002 projected growth
Travel	$14.1	$20.0	18.0%	42.3%
Automotive*	$5.4	$9.0	89.5%	66.7%
Computer hardware and software	$5.9	$7.9	9.0%	33.8%
Office, home and garden	$4.8	$7.3	15.2%	52.5%
Apparel	$4.4	$5.2	43.0%	18.4%
Music video	$2.8	$3.9	4.6%	40.6%
Consumer electronics	$2.6	$3.4	18.2%	31.8%
Tickets	$1.5	$2.6	66.2%	76.1%
Books	$2.0	$2.6	-8.2%	27.2%
Food/beverage	$1.6	$2.4	36.1%	54.6%
Toys	$1.9	$2.3	-11.1%	19.0%
Jewelry and luxury goods	$1.1	$1.2	37.0%	3.3%
Sporting goods and equipment	$0.9	$1.1	15.7%	25.6%
Flowers, cards and gifts	$0.7	$1.0	5.7%	42.2%
Health and beauty	$0.6	$0.8	28.2%	41.5%
Other	$1.1	$1.4	8.6%	25.7%

*Note: *includes web-referred sales as well as parts*
Source: Shop.org and The Boston Consulting Group, June 2002

Because cars are high-ticket items, particularly in relation to the majority of consumer goods sold online, the overall revenue figures are impressive. However, as the Shop.org/Boston Consulting Group study revealed, automotive, although second in terms of revenue dollars, figures toward the bottom in terms of the share of total category sales being conducted online. With just an estimated 2.0% of sales concluded online in 2002, automotive was even lower than the 2.3% average across all retail categories.

Online Retail Market Penetration in the US, by Category, 2000-2002 (as a % of total retail market)

	2000	2001	2002*
Computer hardware and software	16.9%	17.9%	23.4%
Books	12.7%	11.1%	13.5%
Event tickets	3.5%	5.6%	9.5%
Music/video	7.0%	7.0%	9.4%
Travel	5.5%	6.3%	8.4%
Toys	7.3%	6.1%	6.8%
Consumer electronics	4.7%	5.3%	6.6%
Flowers, cards and gifts	3.4%	3.5%	4.8%
Apparel	1.5%	2.2%	2.5%
Sporting goods and equipment	1.7%	1.9%	2.3%
Jewelry/luxury goods	1.6%	2.1%	2.2%
Automotive	0.7%	1.2%	2.0%
Health and beauty	0.8%	1.0%	1.4%
Office, home and garden	0.9%	1.0%	1.4%
Food and beverage	0.3%	0.4%	0.6%
Total online retail as a % of total retail	**1.5%**	**1.7%**	**2.3%**

*Note: *projected*
Source: Shop.org and The Boston Consulting Group, June 2002

Taking a closer look at both wholesale trade and retail sales figures from the US Census Bureau's 2000 Annual Retail Trade Survey reveals that retail sales of motor vehicles and parts (NAICS code 441) have been booming. Year-over-year growth from 1999 to 2000 was 158%. Merchant wholesale trade (NAICS code 4211) grew at a more modest 7.9% rate over the same period, however, in dollar terms, it is far larger than the retail sale component.

Total and E-Commerce Retail Sales for US Motor Vehicle and Parts Dealers, 1999 & 2000

	1999	2000	Year-over-year % change
Total sales (in billions)	$779.98	$817.76	4.8%
E-Commerce sales (in billions)	$1.79	$4.63	158.0%
E-Commerce sales as a % of total sales	0.2%	0.6%	–

Source: US Census Bureau, March 2002

Total and E-Commerce Wholesale Trade for US Motor Vehicles, Parts and Supplies, 1999 & 2000

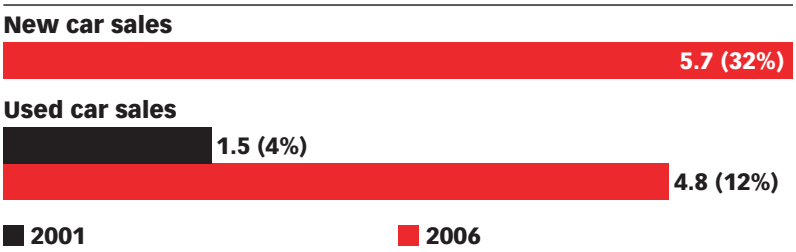
	1999	2000	Year-over-year % change
Total trade (in billions)	$196.08	$199.63	1.8%
Internet-based trade (in billions)	$37.05	$39.96	7.9%
Internet-based trade as a % of total trade	18.9%	20.0%	–

Source: US Census Bureau, March 2002

B. Online Purchasing

Will the internet put an end to the time-honored consumer tradition of going to a car dealer, kicking the proverbial tires and taking a prospective purchase out for a test drive? Jupiter Research suggests that a few years down the road, this might be the case, at least in the US. In December 2001, with the heyday of the internet economy long past, Jupiter predicted that by 2006, 32% of all US new car sales – totaling 5.7 million vehicles – would take place online, up from an estimated 13% in 2001. In similar fashion, the used car segment is predicted to undergo extensive changes, with online sales tripling from 4% of the total in 2001 to 12% in 2006.

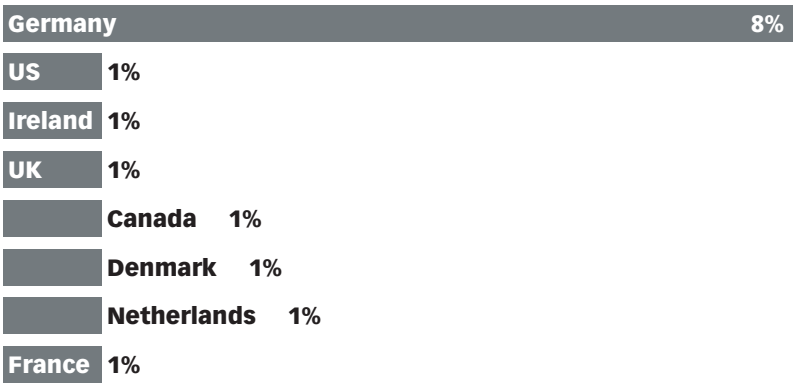
New and Used Cars Sales Online in the US, 2001 & 2006 (in millions and as a % of new or used car sales)



Source: Jupiter Media Metrix, Inc., December 2001

Overall, J.D. Power estimates that 4% of all new-vehicle buyers in the US used the internet as a purchasing tool in 2002, considerably below the figures quoted by Jupiter. Likewise, an annual global e-commerce survey by research firm Taylor Nelson Sofres (TNS) found that consumers in the US lag far behind those in Germany in terms of buying cars online.

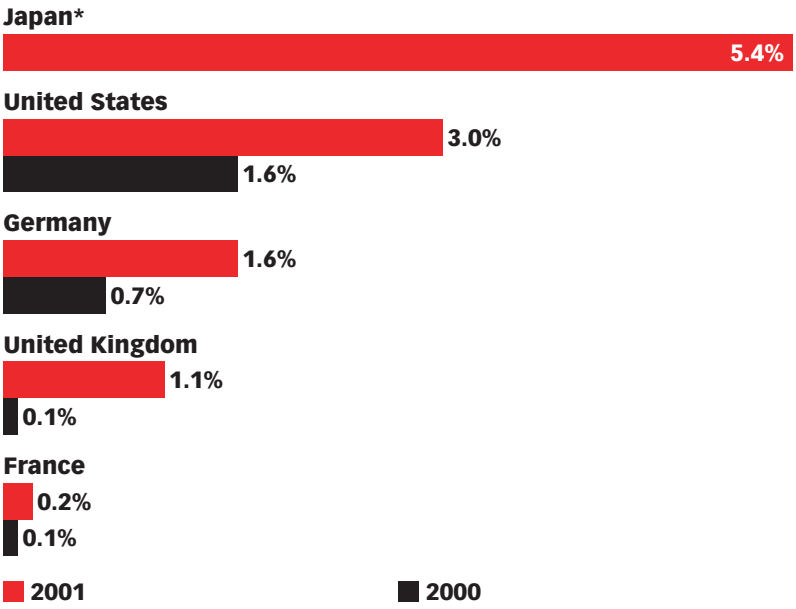
Countries with the Largest Proportion of Online Buyers Who Purchase Cars Online, 2002



Source: Taylor Nelson Sofres (TNS), June 2002

Comparative data from CGEY puts Japanese consumers (not included in the TNS study) as the world leaders in buying cars online. CGEY is also a bit more optimistic about its figures for the US.

Percent of Automobiles Purchased Online in Selected Countries, 2000 & 2001



*Note: *Japan was not included in the 2000 survey*
Source: Cap Gemini Ernst & Young, 2001

The TNS findings would suggest that European consumers and those elsewhere in the world are perhaps farther along in their use of the web as an automobile purchasing tool. However, CGEY's "Cars Online 2002" report, a study of consumer car-buying habits and preferences around the world, offers a divergent conclusion. The eight-country survey, which polled 2,500 consumers in the US, UK, Germany, France, Italy, Sweden, Benelux and Japan, found that 80% of buyers continue to rely on visits to traditional franchised dealers as their main source of automotive information, and still cite the test drive as the most important factor in the buying process.

"The perceived security offered by a franchised dealer still carries significant weight with consumers when making a substantial purchase such as a car."

– Cap Gemini Ernst & Young (CGEY), "Cars Online 2002" report

With these findings in mind, CGEY's conclusion that the internet has had a "negligible" impact on actual car purchasing is unsurprising. The survey found that the internet accounted for just 0.7% of overall car sales. However, a significant percentage of the consumers surveyed said they would consider buying a car online, whether directly from an OEM or dealer website or through an independent internet dealer. For now at least, most dealers view the internet as a source of opportunity for their businesses, as opposed to a threat.

In automotive as with many other retail categories, the internet has helped consumers to research and refine their purchase decisions. However, it looks as if kicking the tires still holds considerable appeal, as does the ability to build a relationship with a dealer. Until these criteria shift dramatically, the internet is likely to remain an auxiliary rather than the main sales channel for car buying.

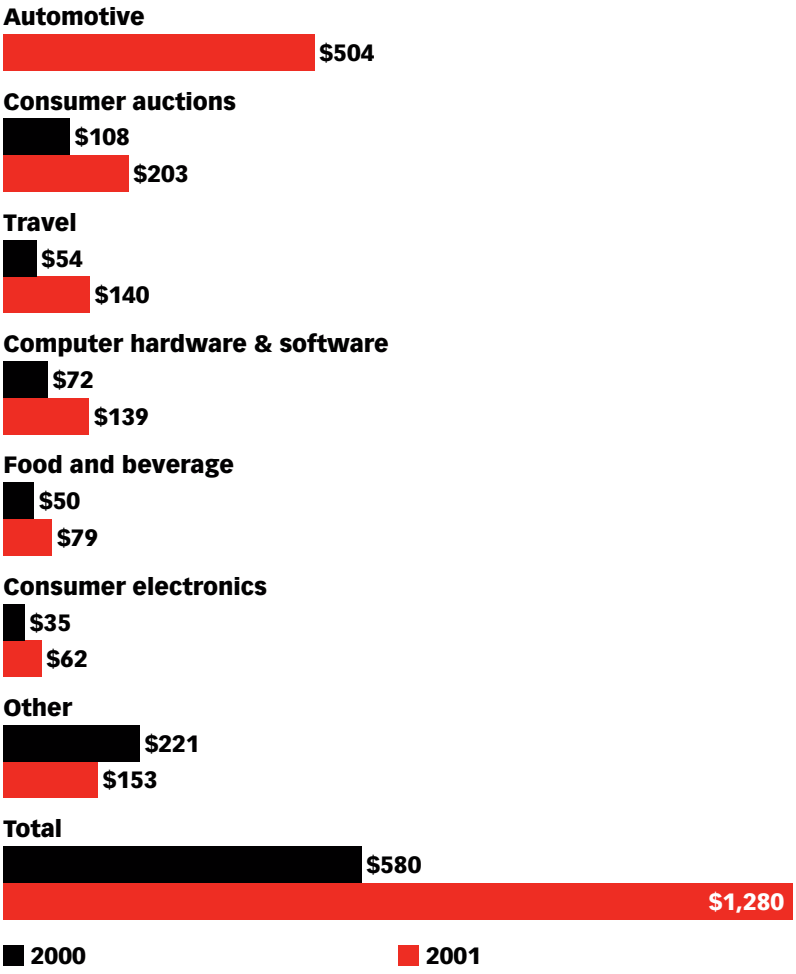
Experiments in Latin America

In an effort to extend its reach and revenues from e-commerce sales among Latin America's rapidly growing internet user population, the Argentine and Brazilian subsidiaries of Yahoo! have inked agreements with local automotive sites. WebMotors powers Yahoo!Autos in Brazil, while in Argentina, the partner is deAutos, both of which have established relationships with in-country suppliers in addition to features such as classified ads, automotive news and road test digests. Yahoo!'s Mexican subsidiary already has an arrangement with GMBuyPower.

Yahoo!'s moves may come as a surprise to observers of the US B2C e-commerce market, where consumers have been more prone to using the internet to research and compare new and used car information, including prices, financing and insurance, rather than actually buying vehicles. However, online automobile sales have been surging in Latin America, thanks in large part to concerted efforts by Fiat, Ford and General Motors to market and sell low-priced cars over the internet. Consumers benefit from lower vehicle prices that are the result of more efficient product planning and reduced dealer inventory costs.

According to a Boston Consulting Group (BCG) study published at the end of 2001, direct automotive sales, which began in limited trials toward the end of 2000, grew nearly 400% in 2001. Garnering an estimated $504 million in revenues, the automotive category, with very high-priced products relative to the CDs or books that make up a typical online purchase, became Latin America's leading e-commerce segment almost overnight.

B2C E-Commerce Revenues* in Latin America, by Category, 2000 & 2001 (in millions)



*Note: *B2C E-Commerce revenues based on retailer revenue (direct sales and agency) and gross value of transactions*
Source: Boston Consulting Group (BCG), November 2001

To date, much of the activity has been concentrated in Brazil, which has the region's largest consumer market as well as Latin America's most highly developed automobile industry. However, the market clearly has room to expand. According to an October 2001 study by São Paulo-based marketing and website rating firm e-bit, just 1.6% of the 1,200 Brazilian consumers surveyed responded that they had purchased a car online. Mexico, which is the site of numerous assembly operations, and Argentina, once it regains its economic footing, could also see growth in online automobile sales.

Although the success of made-to-order economy cars marketed and sold over the internet may be unique to a region populated by consumers with limited spending power, Europe and the US, with their much larger car markets and different supplier-dealer relationships, might be able to derive some important lessons from the experiences of Latin American vehicle manufacturers. More broadly applied, the Latin American model could, over time, engender vast changes in the structure of the global automotive industry.

C. Consumer Preferences

While online retail sales are continuing to see steady growth, perhaps the single greatest indicator of the immense potential for the future of e-commerce is the fact that less than 50% of internet users in the United States actually made an online purchase in 2001. eMarketer analysis indicates that by the end of 2002, this percentage reached just less than 53% of US internet users, leaving room for considerable growth over the next several years.

US Consumer Online Buying and Shopping Grid, 2000-2002

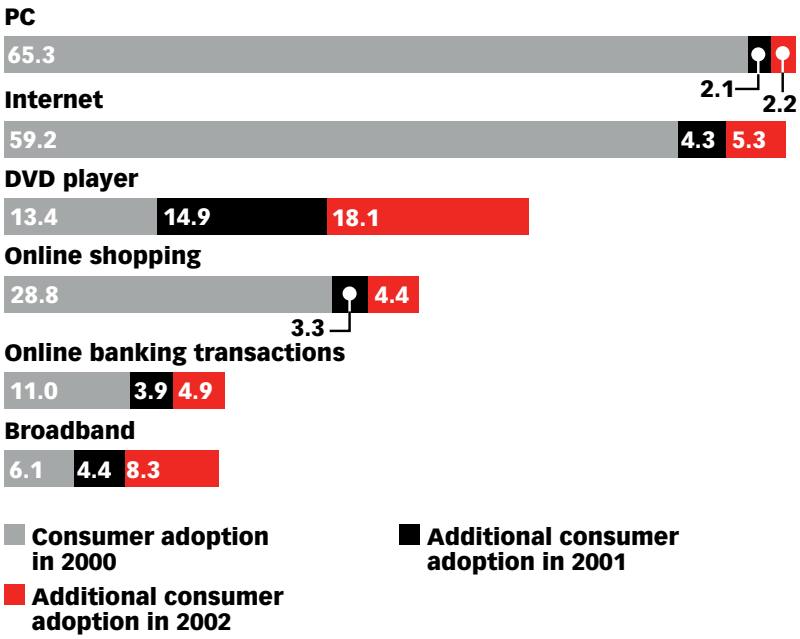
	2000	2001	2002
INTERNET USERS (in millions)			
US population aged 14+ (1)	221.3	223.2	225.6
Total US internet users*	124.0 (2)	142.8 (2)	152.8
Internet users aged 14+	112.6	129.6	138.6
Online penetration among population aged 14+	50.9%	58.1%	61.4%
SHOPPERS			
% Internet users aged 14+	73.0%	77.0%	79.0%
Shoppers aged 14+ (in millions)	82.2	99.8	109.5
BUYERS			
% Internet users aged 14+	47.0%	49.2%	52.4%
Buyers aged 14+ (in millions)	52.9	63.8	72.6
Average annual purchase per online buyer	$769.06	$832.29	$891.18
Total US B2C e-commerce revenues (incl. travel) (in billions)**	**$40.7 (3)**	**$53.1 (3)**	**$64.7**

*Note: *eMarketer's year 2000 and 2001 baselines are from the US Department of Commerce/International Telecommunication Union's estimate of internet users aged 2 years and older; the age 14+ group represents roughly 90% of all users according to the August 2000 US Department of Commerce Survey; **eMarketer benchmarks it's B2C retail revenue figures against US Department of Commerce data, for which the last period measured was Q3 2002; the travel component was formulated based on aggregated data*
Source: eMarketer, October 2002; (1) US Census Bureau, 2000; (2) International Telecommunication Union (ITU), 2000-2002; (3) US Department of Commerce, 2000-2002

When it comes to measuring household adoption of a variety of digital activities, data from Forrester Research shows that PC and internet use reached 69.6 million and 68.8 million US households, respectively, by the end of 2002.

Based upon data from the US Census Bureau, eMarketer estimates that in 2001, there were 107.8 million households in the United States.

US Consumer Household Adoption of Digital Activities, 2000-2002 (in millions)



Source: Forrester Research, October 2002

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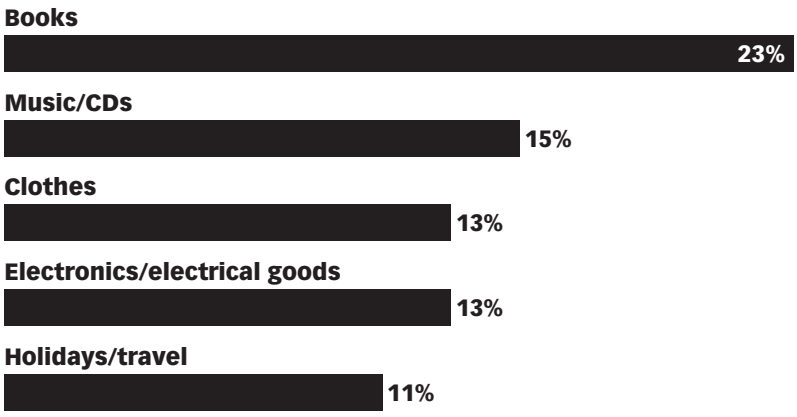
In both the US and on a worldwide level, online car buyers represent a very small portion of internet shoppers. Overall, it hovers around 1%, according to research by TNS.

Worldwide Online Purchases, by Category, 2002 (as a % of internet users who have shopped online during the past month)



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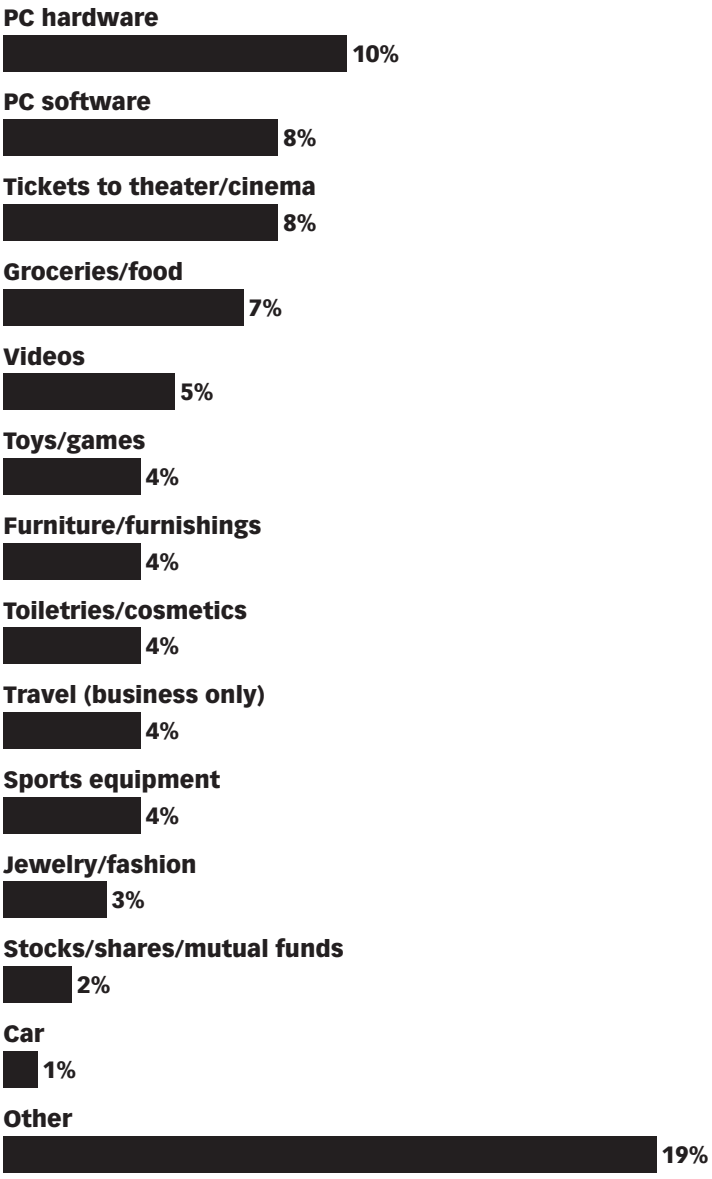

Source: Taylor Nelson Sofres (TNS), June 2002

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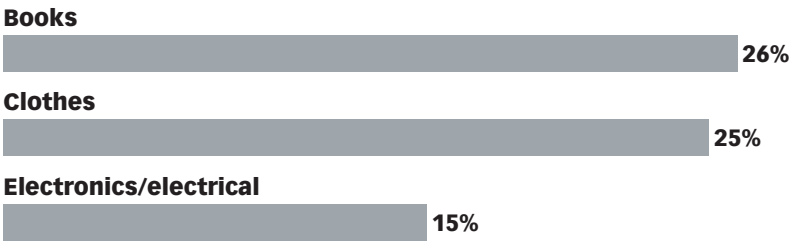
Online Purchases in the US, by Category, 2002 (as a % of internet users who have shopped online during the past month)



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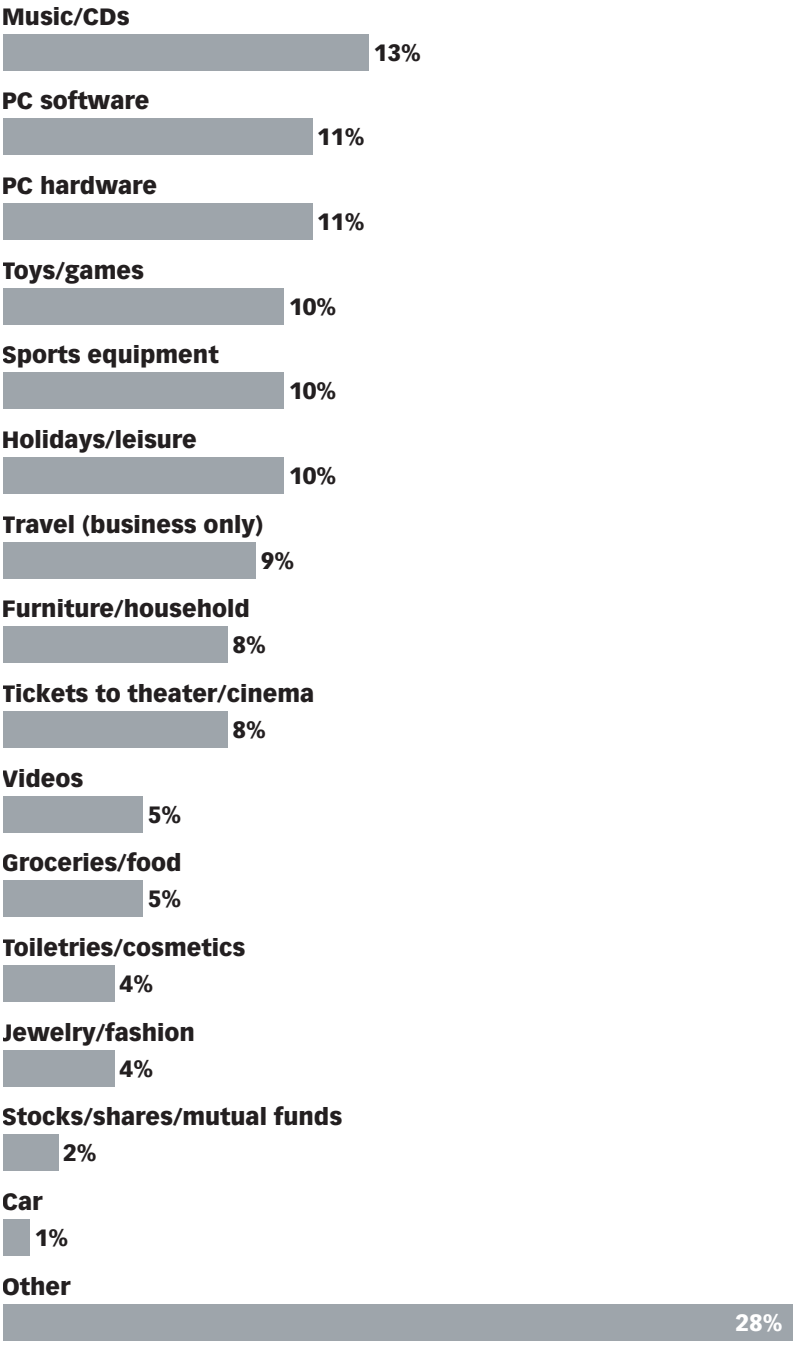

Source: Taylor Nelson Sofres (TNS), June 2002

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"Carbuyers' paths illustrate the multisite consumer experience, and each brand's buyers are different. We recommend using carbuyers' paths to improve the bottom line by using proprietary data and combining it with data from outside organizations. This will lead to a better understanding of buyer behavior, improved payback from CRM investments, and a more harmonious customer organization."

– Mark Dixon Bünger, senior analyst, Forrester Research, 19 February 2002

Although purchase paths may vary, Forrester Research suggests that many prospective car buyers go to information and content sites as a first step, followed by OEM websites and finally on to online car buying or dealer sites to actually complete their purchase. Overall, Forrester has identified four categories into which online car buyers fall, each with its own distinct profile, needs and expectations:

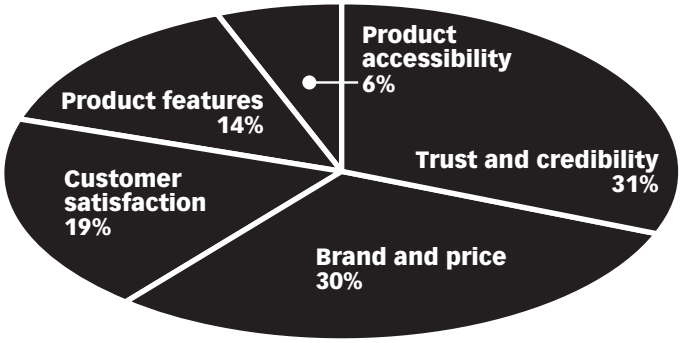
- cruisers – make frequent site visits but just 15% buy a vehicle in the short term
- Forrester recommendation: encourage participation in online surveys to help understand online consumer behavior
- drive-bys – represent the largest consumer segment; make five or fewer site visits but only 20% purchase online
- Forrester recommendation: implement strategies to track point of entry to website and general interests and preferences
- explorers – represent a small segment; almost 50% purchase a new vehicle within 63 days of visiting an automotive website
- Forrester recommendation: create step-by-step guide to purchase process
- off-roaders – usually make quick purchase decisions and demand high level of service
- Forrester recommendation: build distinct lead channels to funnel leads to dealers for consumers who are looking to buy in short term

"The reality is that consumers still need to service their cars until the auto manufacturers figure out their 'no-maintenance' models or drive prices down to a more disposable level. The problem is not that consumers want to buy on the web; it's that they don't like the auto selling experience today!"

– Miller-Williams, "Automotive Customers 2002" report, March 2002

San Diego-based market research firm Miller-Williams suggests that consumers have different expectations about buying car in relation to other products such as PCs or consumer electronics goods. In other words, certain intangibles in addition to price such as trust in and credibility of a particular manufacturer or dealer affect their buying behavior, whether online or off.

Factors Affecting Vehicle Purchase Decisions among US Auto Buyers, 2002 (as a % of respondents)



Note: n=5,521
Source: Miller-Williams, March 2002

GartnerG2 likewise points out that an automaker's brand and the image it conjures for consumers are vital factors in determining a purchase. According to an April 2002 survey of 890 US adults aged 18 or older, 66.8% of respondents characterized a vehicle's brand and what it represents as "very important." Additional GartnerG2 findings include:

- 66.1% agree that vehicles should have their own character
- 62.1% feel that vehicles should express their owners' personality and individuality

"In the automotive industry, consumers do not just drive cars – they drive the entire industry."
–Aberdeen Group, October 2002

Miller-Williams' "Automotive Customers 2002" report indicates that overall, US auto buyers would be willing to spend $2,000 or more on a vehicle purchase if dealers and manufacturers could meet their expectations. This includes making improvements in the following areas:

- education – consumers need more vehicle and competitive intelligence to assist in the buying process
- test drives – consumers in the market for a new vehicle want more in-depth exposure to cars before they make a decision
- dependability – consumers feel the manufacturers and dealers to offer more consistent messages and follow through more reliably on the promises they do make

"There is a need for processes and systems that allow organizations to manage, synchronize and coordinate all customer touch points, including the web, call center, field organization, and partner networks."

– Bill Donlan, CRM practice leader, Adjoined Consulting, as quoted in Miller-Williams press release 26 March 200212

A. Market Size and Growth Potential

A variety of wireless technology, ranging from Bluetooth hardware embedded in new vehicles at the point of production to in-vehicle information systems (IVIS), known also as automotive telematics, promises to change the way people will drive in the years ahead. Telematics, which descend from commercial fleet management systems (FMS) – in wide use since the late 1980s and still a viable market segment worth just under $2 billion in 2001, according to Allied Business Intelligence (ABI) – have a long list of possible applications to the consumer automotive market, as noted in the table below.

Possible Telematics/Bluetooth Applications, 2002

Public safety	Private
Toll collection	Gas/parking lot payment
Collision avoidance	Data transfer
Traffic information systems	Garage access control
Rollover warning alarms	Drive-through payment at stores/ restaurants
Emergency vehicle functions	Rental car check-out/return processing
Low bridge warning	Fleet management
In-vehicle road sign alerts	Purchase/rental of media/entertainment at gas stations/other POS
Border clearance processing	

Source: Allied Business Intelligence (ABI), May 2002

"Telematics is the vehicle's capability to communicate with the outside world. It combines wireless voice and data services with Global Positioning System (GPS) technology to provide specific location services like vehicle navigation, tracking, and emergency services."

– Mahy Churylo, senior analyst, Forward Concepts, 28 May 200213

Researchers including ABI and the Yankee Group remain optimistic about the prospects for the "intelligent vehicle" market (although a number of factors noted in the sections that follow may dampen growth in the near term). ABI predicts that the global telematics market will bring in over $12 billion in revenues by 2007, up from just $1 billion in 2000, with revenues topping the $8 billion mark by the end of 2005. Note that this forecast is somewhat toned down from Gartner Dataquest's December 2001 prediction that worldwide telematics hardware and services would grow into a $27.0 billion market by 2005, as seen in the second chart below.

Worldwide Telematics Revenues, 2001 & 2007 (in billions)

Source: Allied Business Intelligence (ABI), May 2002; telematicsupdate.com, May 2002

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Worldwide Telematics Hardware and Subscription Services Revenues, 2000 & 2005 (in billions)

Source: Gartner Dataquest, December 2001

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North America, particularly the US, Western Europe and Japan constitute the largest markets for IVIS. Several research firms, in fact, estimate the US telematics markets will be worth multiple billions of dollars by 2004.

"The US consumer threshold for in-vehicle services is just under $10 per month. Once services creep past this seemingly unobtainable price point…then the service is a bust."

–Allied Business Intelligence, "The Digital Car: Dynamic Player Roles and Business Models in the Telematics Value Chain" report, May 2002

However, the markets are quite distinct. The table below, with information and analysis from the Minnesota-based Telematics Research Group (TRG), highlights the differences in focus. In the US, for example, safety has been the driving force behind IVIS, while European drivers have sought access to portal-based information to facilitate intra-regional travel. In Japan, TRG sees telematics developing as an extension of in-vehicle navigation systems, which are more widely deployed there than in any other country.

Differences in Telematics Markets among the US, Western Europe and Japan, 2002

US	Western Europe	Japan
Market characteristics		
•Homogeneous market •Large land mass •Spotty wireless coverage •4 wireless platforms •58 cars/sq. mile	•Multiple languages and cultures •Inter-country travel •Widespread wireless and SMS usage •92 cars/sq. mi	•Homogenous market •Difficult point-to-point navigation •Long-term telematics vision •Packet-based wireless service •493 cars/sq. mi
Telematics focus		
•Location-based content •Wireless integration •Navigation	•Travel information •Real-time traffic information •Navigation •Safety/security	•Navigation •Real-time traffic information •Travel •Safety/security
Driving forces		
•Need to keep up with OnStar •Collision event data recorders •Active safety systems	•Websites with mobility information •Wireless phone usage •Active safety systems	•Government-sponsored intelligent transportation systems (ITS) •Wireless phone usage •Active safety systems
Issues		
•Driver distraction •Privacy protection	•Fragmented markets •Language barriers	•Next step beyond navigation systems
Telematics strategy		
•Add content/services to safety/security systems	•Leverage wireless networks	•Leverage navigation systems/wireless networks
Current market status		
•1 million navigation systems •3 million telematics-enabled cars •2.5 million telematics subscribers	•2 million+ navigation systems •Fewer than 50,000 telematics-enabled cars	•6 million navigation systems •4 million+ vehicle information and communication system receivers •Fewer than 40,000 telematics-enabled cars

Source: Telematics Research Group, April 2002

"Japan's leadership in packet-based and 3G cellular deployment will be a catalyst for content-rich telematics in this region."

– Dr. Egil Juliussen, principal technology analyst, Telematics Research Group, 27 February 2002

Not surprisingly, the North American market, with more cars on the road, is projected to produce considerably larger revenues than Europe. According to analysis by market research firm Forward Concepts, North American revenues from telematics equipment sales, subscription and service fees and airtime minutes will total more than $3 billion in revenues by 2006. However, other estimates have the market climbing to more than $9 billion by 2004 in the US alone.

Comparative Estimates: Telematics Revenues in the US, 2004 (in billions)

Source: eMarketer, August 2002; various, as noted, 2001

"The 2003 model year will serve as the platform for U.S. OEMs to delve into new, uncharted waters in telematics by initiating new strategies."

– Frank Viquez, senior analyst, Allied Business Intelligence, 7 May 2002

The US is also the leader in terms of single-country sales of telematics-enabled vehicles as well as in the number of telematics-enabled vehicles in use, although TRG expects IVIS to begin to take off in Europe and Japan in the next five to seven years. Currently, the percentage of telematics-enabled vehicles on the road in the US is far higher than in the worldwide average.

Sales of Telematics-Enabled Vehicles* in the US and Worldwide, 2001, 2003, 2005, 2007 & 2010 (in millions and as a % of total vehicle sales)

	2001	2003	2005	2007	2010
US					
Telematics-enabled vehicle sales (in millions)	1.6	2.4	3.9	6.6	12.9
Share of worldwide telematics-enabled vehicle sales	89.1%	75.7%	62.9%	54.4%	47.1%
Telematics-enabled vehicle sales (as % of total US vehicle sales)	9.1%	14.3%	22.3%	37.1%	73.3%
Worldwide					
Telematics-enabled vehicle sales (in millions)	1.7	3.2	6.1	12.2	27.4
Telematics-enabled vehicle sales (as % of total worldwide vehicle sales)	3.1%	5.6%	10.4%	19.7%	43.7%

*Note: figures have been rounded to one decimal place; *Non-commercial passenger cars and light trucks*
Source: Telematics Research Group, October 2002

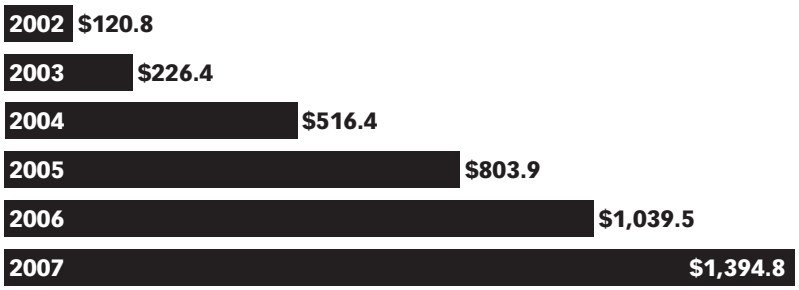
Telematics-Enabled Vehicles in Use in the US and Worldwide, 2001, 2003, 2005, 2007 (in millions and as a % of total vehicles in use)

	2001	2003	2005	2007
US				
Vehicles in use (in millions)	216	222	230	239
Telematics-enabled vehicles in use (in millions)	2.7	7.0	13.9	25.6
Telematics-enabled vehicles in use (as % of total US vehicles in use)	1.3%	3.2%	6.0%	10.7%
Worldwide				
Vehicles in use (in millions)	721	742	770	799
Telematics-enabled vehicles in use (in millions)	3.0	8.5	18.9	39.9
Telematics-enabled vehicles in use (as % of total worldwide vehicles in use)	0.4%	1.1%	2.5%	5.0%

Source: Telematics Research Group, November 2002

Western Europe, nonetheless, is a substantial secondary market. The Yankee Group, for example, anticipates that approximately 40% of all new cars sold in Western Europe will contain telematics equipment by 2007, with an overall market of more than 18 million telematics-enabled cars. Service revenues alone will total nearly $1.4 billion in revenues by that point, although most of these will accrue to mobile network operators, not original equipment manufacturers (OEMs), at least after 2004, as seen in the second chart below.

Telematics Service Revenues in Europe, 2002-2007 (in millions)



Source: Yankee Group, June 2002

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Telematics Service Revenues Retained by Mobile Operators in Europe, 2002-2007 (in millions)

	2002	2003	2004	2005	2006	2007
Revenue retained by mobile operators	**$18.1**	**$45.3**	**$247.9**	**$450.2**	**$665.3**	**$976.4**
Total telematic service revenues	$120.8	$226.4	$516.4	$803.9	$1,039.5	$1,394.8

Source: Yankee Group, June 2002

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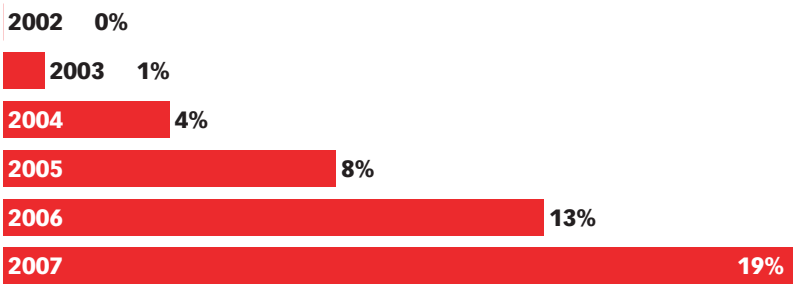
Other Applications and Gadgets: Bluetooth and Vehicle Location Devices

The diffusion of Bluetooth hardware (much delayed, but finally coming to fruition, it would seem) could potentially provide a boost to beleaguered telematics firms. Bluetooth chipsets facilitate some of the same functions as telematics services, such as cashless payments systems and data transfer, but they have the added benefit of helping to synchronize a car's on-board and engine management computers, which are becoming increasingly sophisticated. According to ABI, 19% of all new vehicles around the world will come equipped with Bluetooth hardware by 2007. Certain Chrysler vehicles in the US and limited Saab and BMW models sold in Europe now offer Bluetooth kits as optional equipment.

Penetration of Bluetooth Hardware in New Vehicles Worldwide, 2000 & 2002 (as a % of new vehicle production)



Source: Allied Business Intelligence (ABI), September 2002

Among other intriguing, albeit not widely diffused applications of in-vehicle technology are automatic vehicle location devices that allow car owners to track and control their vehicles remotely. Although widely diffused among commercial trucking fleets for some time, the location devices, which function through a fusion of wireless services with global positioning systems (GPS), are increasingly available in the consumer market, as something of an extension of manufacturer-installed CD- or DVD-ROM-based navigation systems and emergency services such as General Motors' OnStar and Mercedes' Tele Aid (a private-label telematics system supplied by ATX Technologies).

The possibilities the devices currently offer are extensive, ranging from the ability to start the car, roll up the windows and receive alerts about theft. Forrester Research consumer surveys indicate that 50% of new-car shoppers want the ability to monitor their vehicles. However, the high cost of the devices, estimated at $600 to $1,200 including installation charges, coupled with lofty monthly usage fees, have so far kept the market for "remote-controlled" vehicles small.

"Telematics has the potential to convert automobiles from a mere mode of transport into mobile information stations...."

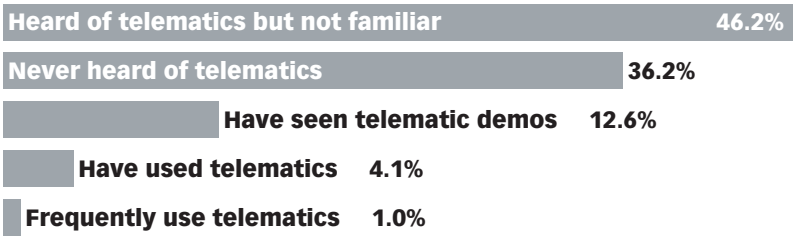
– Booz Allen Hamilton, "Insights," Vol. 3, Issue 2, 2001

B. Consumer Adoption and Preferences

Technology OEMs and consultants as well as their marketing partners are naturally excited by the possibilities inherent in telematic services, an excitement reflected in the overheated rhetoric being pitched to consumer end-users. However, the most challenging aspect of IVIS may lie in raising consumer interest in the technology. For example, a March 2002 Dove Consulting survey found that 46.2% of North American respondents had heard of telematic services but were not familiar with them, while 36.2% had never heard of in-vehicle information systems at all.

A September 2002 survey by GartnerG2 provides additional details. It found that just 1.3% of US households (approximately 1.3 million homes) planned to order telematics services on a new vehicle in the next 12 months – equal to roughly 1.2 million new cars (or 7.6% of total new car sales). Another 17% of households are interested in telematics, but do not have plans to adopt the services. However, most of the households surveyed – 67% – are not interested in getting telematics service at all, at least not in the upcoming year.

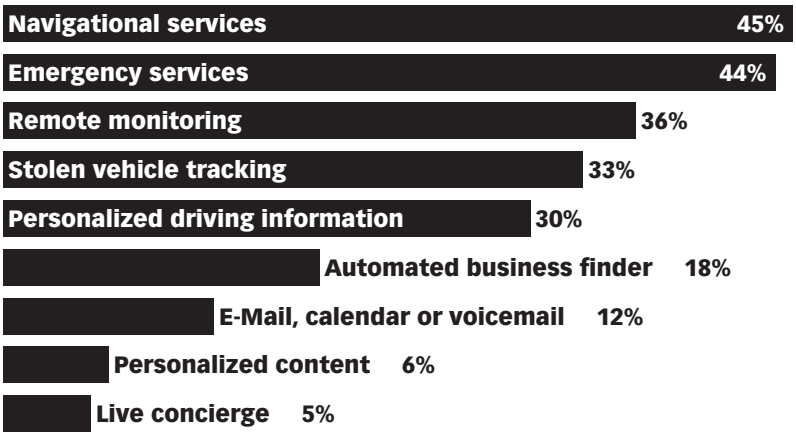
Awareness of Telematics Services in North America, February 2002 (as a % of respondents)



Note: n=374
Source: Dove Consulting, March 2002

Navigation and emergency response services are the telematics features that US consumers would be most interested in having in their cars, according to a survey conducted by Jupiter Research. The study further indicates that US consumers are willing to pay for wireless services in their cars despite a $400 up-front cost for equipment and installation.

Vehicle-Based Wireless Services US Consumers Would Be Interested in Using, 2002 (as a % of respondents)



Source: Jupiter Research, April 2002; telematicsupdate.com, May 2002

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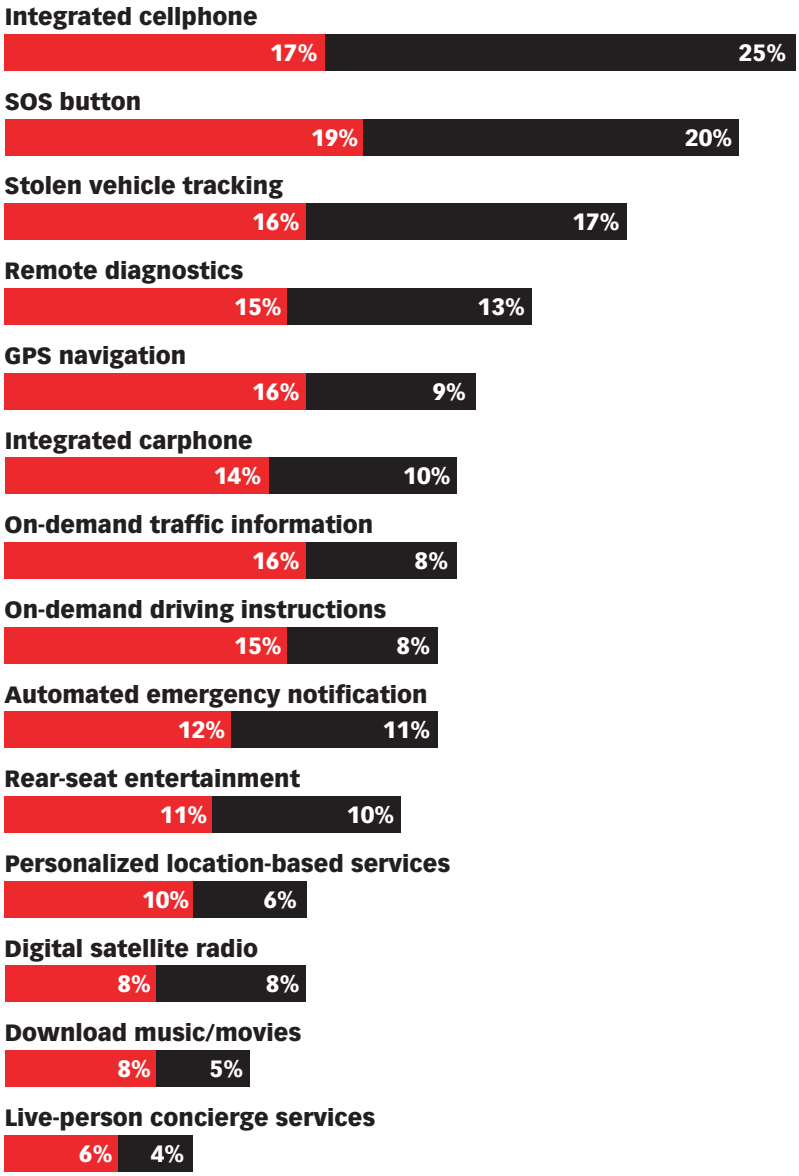
More (and largely similar) detail about consumer interest in telematics comes from the September 2002 GartnerG2 study. It found that an integrated cellphone, with hands-free, voice-activated controls was the top choice, followed by an SOS button to contact emergency services. In terms of year-over-year growth in consumer interest, the greatest increase was in remote vehicle diagnostics, while the appeal of systems with e-mail capability saw the greatest drop.

Probability of US Consumer Adoption of Telematics Applications in Next New Vehicle, 2002 (as a % of respondents)



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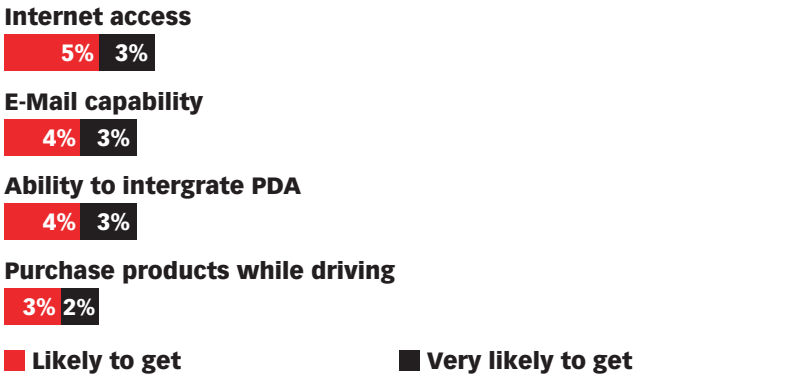
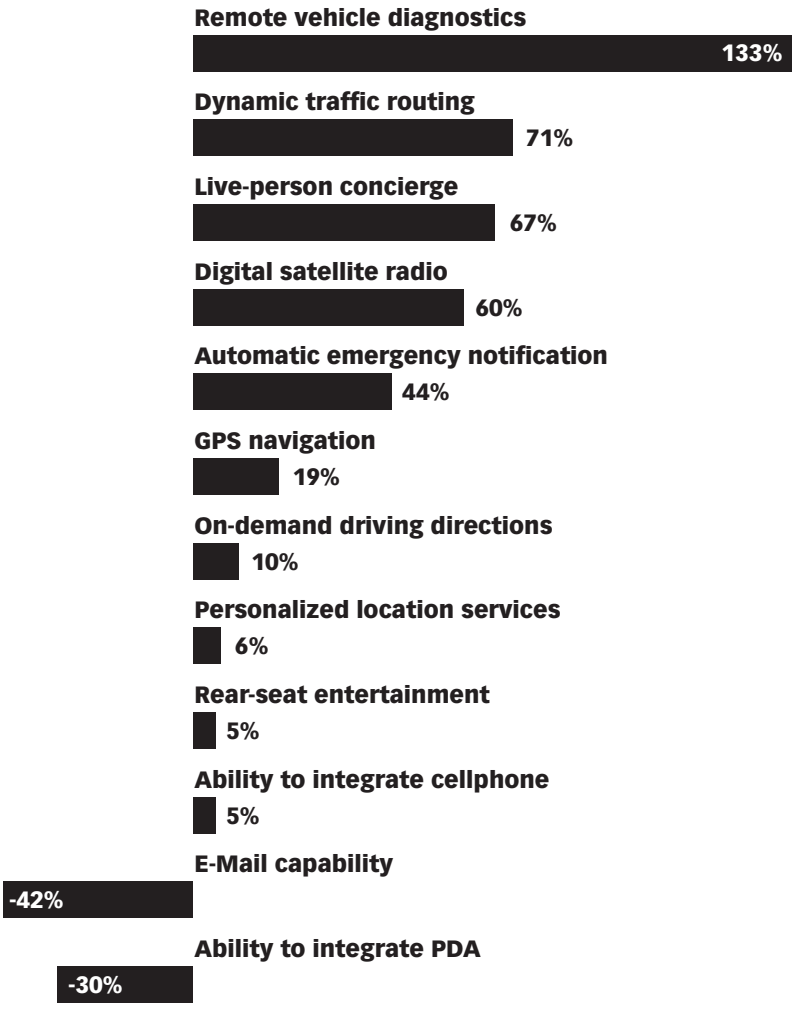


Source: GartnerG2, September 2002

Change in US Consumer Demand for Telematics Applications, 2002 vs. 2001 (as a % increase/decrease vs. prior year)



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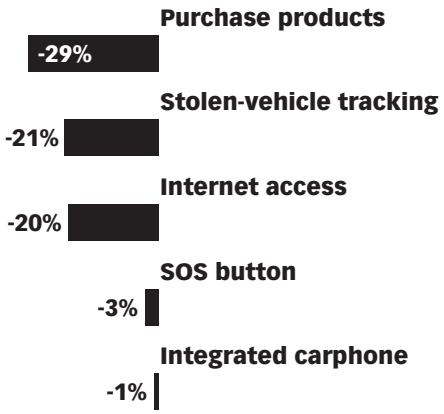
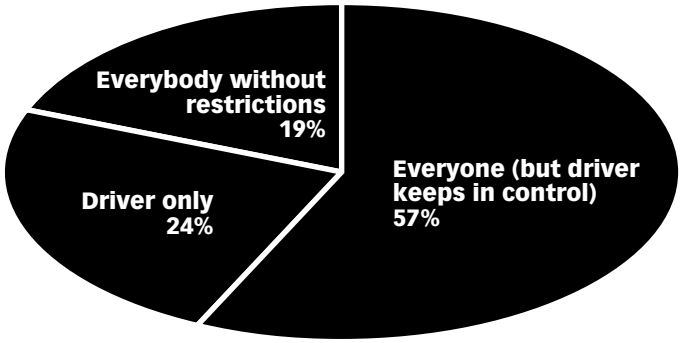


Source: GartnerG2, September 2002

An additional consideration is who in the car should have access to IVIS. Currently, the placement of most IVIS restricts access and usage of buttons and voice-activated controls to the driver and passenger in the front seat. This need not always be the case, however.

In fact, according to a survey of 1,024 US adults aged 18 and older by GartnerG2, 57% of consumers think that all passengers should have access to the car's telematics system, although they feel that the driver should ultimately remain in control of the system. Another 24% think the driver should be the only one in a car with access to the IVIS. A slightly smaller percentage (19%) of consumers believe all vehicle occupants should have unfettered access to the telematics system.

Attitudes of US Consumers Regarding Who Should Control and Access Telematics Applications, 2002 (as a % of respondents*)



*Note: *n=1,024 US vehicle owners*
Source: GartnerG2, January 2002

The introduction of new, more user-friendly (and perhaps more driver safety-oriented) services such as hands-free speech recognition may help spur consumer demand. High-end OEMs such as BMW and Jaguar already employ some degree of speech recognition technology to power on-board computers and climate control systems, and as this improves, it is likely to spread to telematics applications as well (voice-activated controls are already available on many dealer- or manufactured-installed in-car telephone systems). In general, voice-activated controls have proven to be less distracting to drivers than fiddling with numerous buttons or browsing a long series of menus, and hence, should be incorporated as a safety enhancement of any new telematics service offered by OEMs.

"The huge surge in telematics subscriber rates in the US was artificially created by GM."

–Allied Business Intelligence, "The Digital Car: Dynamic Player Roles and Business Models in the Telematics Value Chain" report, May 2002

C. Issues for OEMs and Telematics Service Providers (TSPs)

In comparison to the number of vehicles on the road, estimated by TRG to reach 742 million worldwide in 2003, those currently equipped with IVIS represent a small fraction, although as the charts below demonstrate, the pool of models on which telematics systems are standard or optional equipment is sizable and growing all the time. According to TRG, North America has the highest number of different models available with telematics, primarily those in the GM family, although Western Europe, where far more vehicle configurations are available, has the largest number of different trim levels featuring telematics hardware. In Japan, the high average cost of the hardware is balanced by relatively low (in comparison to Europe and North America) annual TSP charges.

Note that the data in the chart below are drawn from a dynamic database, which is updated as new models, trim levels and configuration become available. This explains why the more recent model and trim level totals by region in the first chart do not exactly match the information in the second chart, which are broken out by manufacturer as well as by region.

Availability of Telematics Hardware as Standard or Optional Equipment on Vehicles Sold in Japan, North America and Western Europe, 2002

	Japan	North America	Western Europe
Number of models with telematics	68	103	66
Number of trim levels with telematics	402	606	874
Number of trim levels with standard telematics	–	305	18
Average cost of telematics hardware	$2,246	$1,663	$1,787
Average annual TSP charge	$145	$212	$235

Source: Telematics Research Group, August 2002

Vehicle Trim Levels Available with Telematics as Standard or Optional Equipment, by Global Automotive Brand and Region, 2002

	Name of telematics service	1st year telematics offered	North America	Western Europe	Japan	World-wide total
Acura	OnStar	2001	8	–	–	8
Alfa Romeo	Connect	2001	–	191	–	191
Audi	Teragon/ OnStar	2000/ 2002	50	80	–	130
BMW	Assist (Voda-phone/ATX)	1998	51	41	–	92
Buick	OnStar	1998	21	–	–	21
Cadillac	OnStar	1997	36	–	–	36
Chevrolet	OnStar	1998	107	–	–	107
Citeron	AutoPC	2000	–	33	–	33
Fiat	Connect	2001	–	145	–	145
Ford	Ford Telematics	2001	–	160	–	160
GMC	OnStar	1997	69	–	–	69
Honda	Inter Navi	1998	–	–	70	70
Infiniti	Infiniti Communi-cation	1997	11	–	–	11
Jaguar	Deluxe Communi-cation	2000	6	–	–	6
Lexus	Lexus Link	2001	2	–	–	2
Lincoln	VCS (RESCU)	1996	3	–	–	3
Mazda	Mazda Telematics	2000	–	–	46	46
Mercedes-Benz	Tele Aid	2000	92	61	–	153
Nissan	CompassLink/ CARWINGS	1998/ 2002	–	–	125	125
Oldsmobile	OnStar	1998	22	–	–	22
Opel	OnStar	2000	–	71	–	71
Pontiac	OnStar	1998	42	–	–	42
Saab	OnStar	2000	32	–	–	32
Toyota	Monet/ G-Book	1998/ 2003	–	–	162	162
Volvo	On Call Plus	2001	13	–	–	13
Totals by region			**565**	**782**	**403**	**1,750**

Source: Telematics Research Group, 2002

However, because telematics services represent a high value-added component on new cars sold today – both in terms of the hardware and on the service side – branding, as Allied Business Intelligence (ABI) points out, is of vital concern to OEMs that equip their vehicles with IVIS as well as to the TSPs. In short, the question is: to whom do the customers belong?

At issue is the way the two leading US TSPs – OnStar, owned by General Motors (GM) and the independently owned ATX Technologies – market and brand their services to OEMs. With the exception of a solution developed for Lexus, OnStar does not offer private-label services, while that is ATX Technologies' main business, with clients such as Mercedes, which markets its telematics service under the Tele Aid brand.

In June 2002, as part of a campaign to stanch loss-making operations, Ford Motor Company dissolved its partnership with QUALCOMM in Wingspan, an attempt at building a service to compete with GM's OnStar. Although Ford continues to offer telematics services from ATX Technologies on its Lincoln brand (known as Lincoln RESCU) and on Jaguar models (known as Jaguar Assist), it recently contracted with Cross Country Automotive Services to provide a telematics system for its Volvo brand, like Jaguar, a member of Ford Premier Automotive Group. The Volvo system, also a private-label solution, is known as Volvo On Call Plus.

"Automotive players will have a hard time capturing a piece of the telematics pie, primarily because they lack consumer focus and understanding of mobile services. In addition, they are more distant from the fast-changing technologies that drive telematics than their emerging competitors, which are also able to innovate faster."

–Francois Truc, vice president, Booz Allen Hamilton, 16 October 2001

In the case of OnStar and the other car manufacturers to which it licenses its services, non-GM brands such as Acura, Audi and Subaru benefit from offering their customers cutting-edge technology, but a natural conflict also exists in that these OEMs are sending a revenue stream as well as access to their customers to a competitor. For those OEMs that contract with ATX Technologies and Cross Country Automotive Services, the conflict of interest does not exist, as the TSPs are there to collect and pass along customer usage data to the OEMs.

Leading US Telematics Service Providers (TSPs) and OEM Partners, 2002

TSP	Ownership	OEM Partners	
ATX Technologies	**Independent**		
		BMW	Jaguar
		Ford/Lincoln	Mercedes-Benz
		Infiniti	
Cross-Country Automotive Services	**Cross Country Group**		
		Volvo	
OnStar	**General Motors (GM)**		
		Acura	Isuzu
		Audi	Oldsmoblie
		Buick	Pontiac
		Cadillac	Saab
		Chevrolet	Saturn
		GMC	Subaru
		Hummer	

Source: company websites, 2002

The situation in Europe is somewhat analogous to the US, in that third-parties provide IVIS to automotive OEMs. However, as noted above, the European market is considerably different than the US not only because of its compact geography and multiplicity of languages but also for consumers' emphasis on traffic data, navigation aids and travel information. To date, TSPs have tended to have single-country operations, but TRG indicates that pan-European service is in the works for Tegaron, among others.

In Japan, meanwhile, all of the leading OEMs have sponsored their own TSPs, making a model distinct from the US or Europe. Consistent with the country's highly advanced wireless market, expect the Japanese TSPs to begin offering sophisticated content and services in the near term.

Leading Telematics Service Providers (TSPs) and OEM Partners in Europe and Japan, 2002

	TSP	OEM Partners
Europe		
	Targa Services	Alfa Romeo
		Fiat
		Lancia
		Peugeot
	Tegaron	Audi
		Citroen
		Mercedes-Benz
		Volkswagen
Japan		
	CARWINGS	Nissan
	CompassLink	Nissan
	Inter Navi	Honda
	Monet	Monet
	Telematics Center	Mazda

Note: Japanese TSPs are sponsored by the OEMs themselves
Source: Telematics Research Group, April 2002

While consumers may be happy to use IVIS as long as they are free, as many are for an initial period for those models that come equipped with telematics devices, renewal rates following the end of the grace period have been dismal. The clear message from customers is that they are unwilling to pay high monthly service fees – a lesson OEMs and their TSP partners should take care to heed.

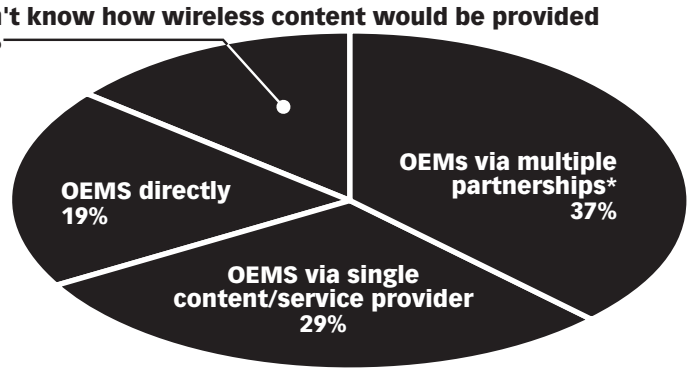
"Passengers have been overlooked as telematics users in providers' marketing initiatives. To increase consumer adoption for telematics services, manufacturers should focus on all potential passengers and develop specific applications that are of value to each audience, such as web-based games for children."

– Thilo Koslowski, automotive analyst, GartnerG2, 15 May 2002

As the largest single passenger vehicle market in the world, the US is obviously key to the success of in-vehicle wireless technologies. ABI has estimated that the threshold for IVIS among US consumers is just under $10 per month. If one assumes that more or less the same holds for the leading automotive markets in Western Europe, OEMs, service providers and applications engineers must work together to entice consumers by offering low-cost or free telematics services on new vehicles for a limited period and then price the subsequent subscription rates accordingly so as to ensure a maximum renewal rate. Alternately, they might, as GartnerG2 suggests, look at IVIS as a unique customer relationship management tool.

Research by KPMG among automotive industry executives in North America and Europe indicates a lack of consensus about what type of company should supply wireless content to IVIS and whether monthly subscription fees or charges for specific services would constitute the principal source of revenues. Although 40% of those surveyed felt that the rise in importance of telematics would not force automakers to adopt business strategies and practices used by telecommunications firms, 36% believed that the focus on providing telematics services would steer car manufacturers more towards the telcos. Note that this data is drawn from KPMG's first annual automotive industry survey, which was conducted in the fall of 2001.

North American and European Automotive Executives' Predicted Methods of Providing Wireless Content to In-Vehicle Information Services, November 2001 (as a % of respondents)



*Note: n=113 automobile manufacturer and supplier executives; *customers choice of content/service providers*
Source: KPMG, November 2001

North American and European Automotive Executives' Predicted Sources of Revenues by OEMs for In-Vehicle Information Systems, November 2001 (as a % of respondents)

Note: n=113 automobile manufacturer and supplier executives
Source: KPMG, November 2001

Among research firms that cover telematics, GartnerG2 is particularly pessimistic about the short-term prospects for IVIS, predicting that widespread consumer adoption will not occur anytime before 2004. In the meantime, GartnerG2 suggests that TSPs "think outside the vehicle" and enter new markets in order to ensure survival in the near-term. However, it also encourages car manufacturers not to abandon their telematics programs, but to refocus them on basic, affordable service options that appeal to consumers. Cited as a model is DaimlerChrysler's Bluetooth-based UConnect offering, which requires consumers to pay only for the hardware (estimated at $299 plus labor). As the system uses the consumer's existing wireless phone, there are no service fees beyond airtime charges.

The combination of a down economy and slow consumer adoption of telematics services mandates a rethinking of current strategies. Otherwise, IVIS and other wireless automotive systems risk becoming yet another example of a promising consumer technology that failed to meet expectations.

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