



Automotive Industry Trends in Electronics: Year 2000 Survey of Senior Executives

Summary

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1 Data Collection

- 24-question survey
- 84 automotive executives responded
- 45% were vice-presidents or above, 73% were directors or above
- Representatives from assemblers, integrators, Tier One/Tier Two suppliers, etc.
- 42% were in design/engineering

2 General Conclusions

Overall

1. No single outstanding response for most questions
2. Often little discrimination between options
3. Overall agreement in responses of OEMs and suppliers
4. Pace of change will quicken
5. Competitive focus on current major organizations
6. Concerns about regulations for telematics
7. General need for standards

Other key specific conclusions

1. Purchasing electronics as chunks will improve vehicles (yes:no by 2:1 margin).
2. Plans for future electronics will be most disrupted by:
 - a. In general, more rapid introduction of technology
 - b. Expanded driver distraction legislation
 - c. Faster than expected adoption of 42 v
 - d. Lack of wireless standards
 - e. Insufficient wireless infrastructure for demand

3 Product Development Process and OEM-Supplier Relationships

What is the major OEM-supplier problem?

Problem	%
Assemblers too preoccupied with price	16
Failure to create OEM-supplier partnership	12
Lack of industry standards and requirements	12
Excessively long automotive development cycle	12

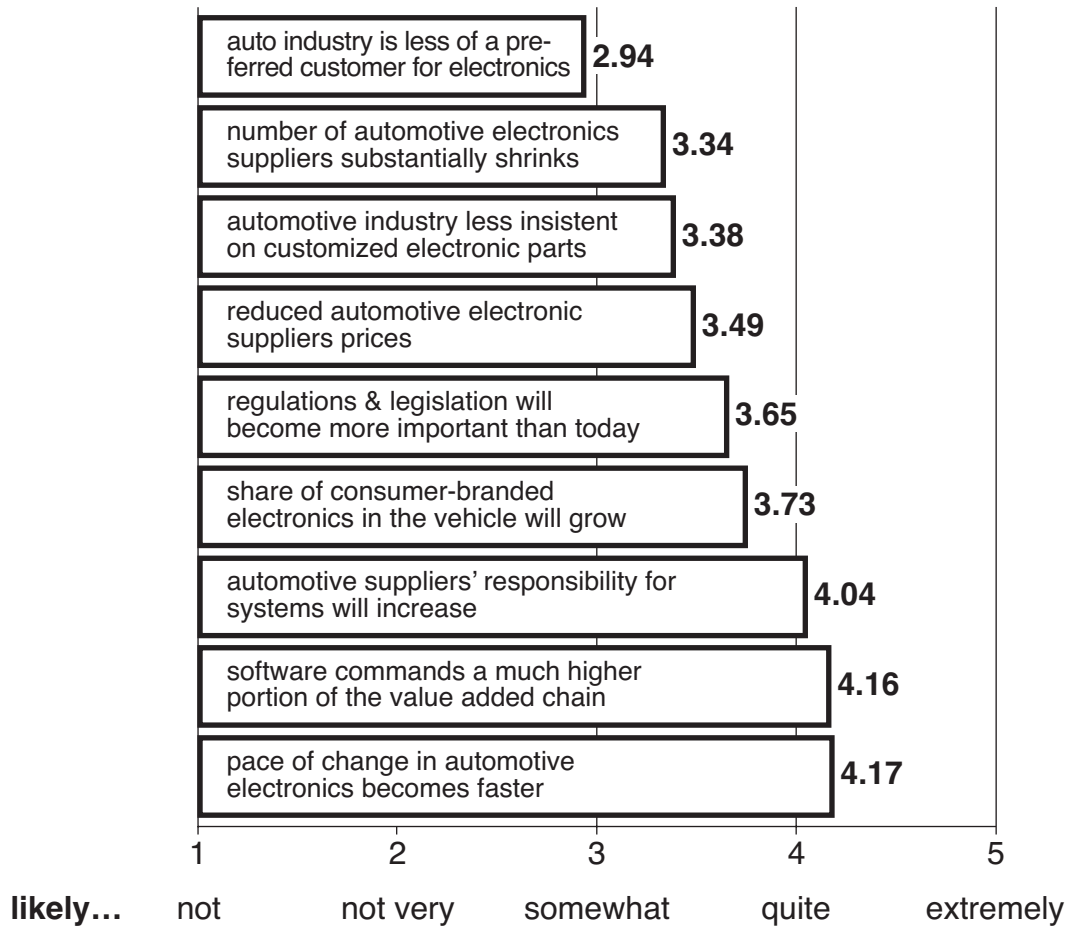
What are the attributes of outstanding OEMs and suppliers?

Attribute	OEM	Supplier
Has working relationship with supplier		x
Technically savvy workforce	x	
Systems view of vehicle		x
Onsite customer support		x
R&D investment	x	x

How can the development time for electronics be reduced?

Mean Effectiveness		Solution
Power-train	Driver Information	3=Somewhat effective, 4= Effective, 5=Extremely effective
3.79	4.33	Open architecture standards independent of applications
3.00	4.21	Provide plug and play (open) bays with utilities
3.49	4.07	Commodity product standardization
3.45	4.04	Upgrade capability for applications software in the field
3.60	4.02	Greater software reconfigurability
3.62	3.79	Specify and purchase as tested subsystems/modules
3.21	3.79	Common electronics boxes with full software configurability
3.87	3.61	Very good design rules to aid design and manufacturing
3.23	3.61	Develop "lightning track" process for this class of applications
3.11	3.46	Eliminate detailed internal component-level specifications
2.42	3.42	Include more consumer & non-automotive electronics suppliers
3.58	3.40	Pre-analyzed "design chunks," cataloged for use
3.98	3.37	Improved simulation and analysis tools
2.32	3.30	Shift increasing share of intelligence to server-based hubs
3.49	3.25	Adherence to assurance/stress testing vs. life testing
2.75	2.93	Utilize a supplier advisory council

How likely is each development by 2005?



4 Electronics Content of Future Vehicles

How important are the factors that affect the electronics content of vehicles?

Quite Important	Somewhat—Quite Important
Communications	Revenue opportunities
Safety	Vehicle performance
Comfort and convenience features	Entertainment
	Model differentiation
	Cost
	Networking
	Quality

When Will Features be Available in 10% of New Luxury Vehicles?

Category	Mean	Feature (up to 2007 only)
Entertainment and convenience	2004.7	Satellite radio
	2004.8	Removable media for entertainment and data
	2005.2	MP3 support
	2005.8	Built-in electronic toll and payment tag
	2006.3	Karaoke
Driver information and communication	2004.3	Built-in wireless phone interface
	2004.4	GPS navigation
	2004.8	Email/Internet access
	2004.8	Built-in PDA (e.g., palm) docking station
	2005.2	Bluetooth support
	2005.3	Automatic download of traffic information
	2005.6	Downloadable software features
	2005.6	Downloadable software fixes
	2005.8	General purpose text/data speech capability
	2005.9	Large general purpose display
	2005.9	Off-board applications via data link
	2006.2	General purpose computer (e.g., AutoPC)
	2006.8	Open electronics bay with utilities
	2006.9	Interface to wearable computer
Safety and security	2004.6	Automatic collision notification
	2004.8	Adaptive cruise control
	2005.0	Rear parking aid
	2005.3	Blind spot detection and warning
	2005.5	Voice operation of some controls
	2005.6	Forward collision warning
	2005.7	Forward parking aid
	2005.7	Lane departure warning
	2005.9	Night vision
	2006.0	Black box crash recorder
	2006.1	Forward collision braking only
	2006.3	Drowsy driver detection
	2006.8	Fingerprint or voice-controlled entry
Electrical, propulsion, and control	2005.7	Dual voltage (42/12 volt)
	2006.0	Active suspension
	2006.7	42 v electrical system

What is the Most Likely Unexpected Product Success/Failure?

success: voice recognition (17%)

failure: email/Internet (20%)