

When it comes to **smart cars**,
Who will come out a **winner**?



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This is the abridgement of the report "When it comes to smart car, Who will come out a winner?".
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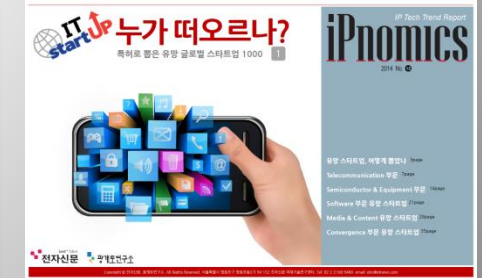
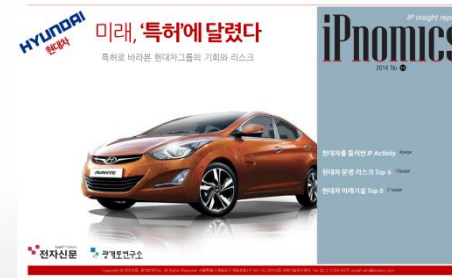
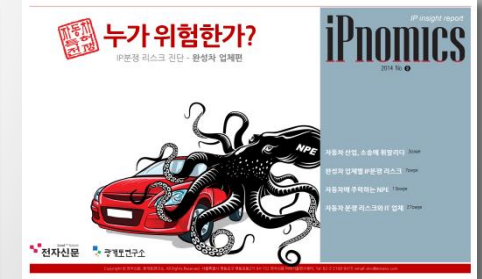
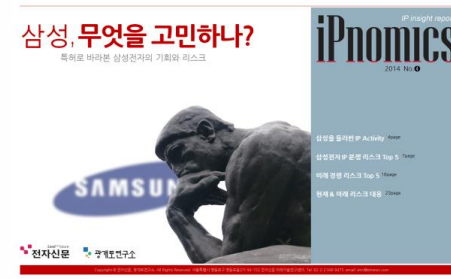
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Technology Trend

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SAMPLE

In the automotive industry where there is a paradigm shift taking place towards incorporating smart car technologies and intensifying technological competition at the same time, **patents have become, perhaps, the most important variable.**

- ① Vehicle Control
- ② Land Vehicle Alarms and Indicators
- ③ Navigation
- ④ Applications
- ⑤ External Condition Vehicle-Mounted Indicator
- ⑥ Relative Location
- ⑦ Vehicle Position Indication
- ⑧ Directive
- ⑨ Special Applications

TOP 9



In the automotive industry where there is a paradigm shift taking place towards incorporating smart car technologies and intensifying technological competition at the same time, patents have become, perhaps, the most important variable. Patent litigation involving smart cars is increasing. In the automotive industry, patent litigation is becoming a more prominent issue. Patent litigation involving smart cars is becoming a more prominent issue. Patent litigation involving smart cars is becoming a more prominent issue.

SAMPLE

To summarize, the top 9 core smart car technologies that have been deemed to be the most noteworthy of the year: Vehicle Control, Land Vehicle Alarms and Indicators, Navigation, External Condition Vehicle-Mounted Indicator, Relative Location, Vehicle Position Indication, Directive, Special Applications, and Applications. Of those five the greatest number of patents (3,302) is concentrated in the Vehicle Control segment which accounts for about 30% of all such patents.

For the purposes of this study we analyzed various technologies in terms of (1) influence of patent IP, (2) IP activity and (3) IP risk, and then selected the

top 9 core smart car technologies that have been deemed to be the most noteworthy of the year: Vehicle Control, Land Vehicle Alarms and Indicators, Navigation, External Condition Vehicle-Mounted Indicator, Relative Location, Vehicle Position Indication, Directive, Special Applications, and Applications. Of those five the greatest number of patents (3,302) is concentrated in the Vehicle Control segment which accounts for about 30% of all such patents. For the purposes of this study we analyzed various technologies in terms of (1) influence of patent IP, (2) IP activity and (3) IP risk, and then selected the

With their total of 454, Honda is the second most active company in the smart car patent space. Hyundai was quite successful in the smart car patent space with a total of 454 patents. Hyundai was quite successful in the smart car patent space with a total of 454 patents. Hyundai was quite successful in the smart car patent space with a total of 454 patents.

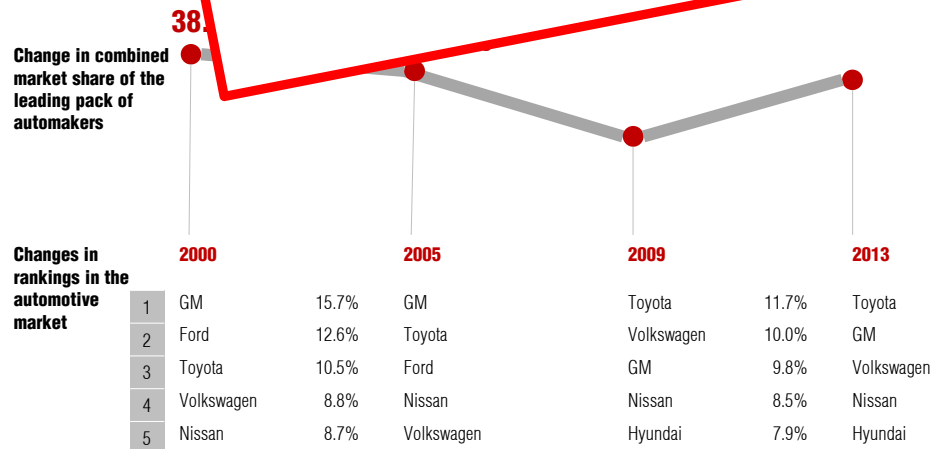
SAMPLE



Smart cars and the business environment

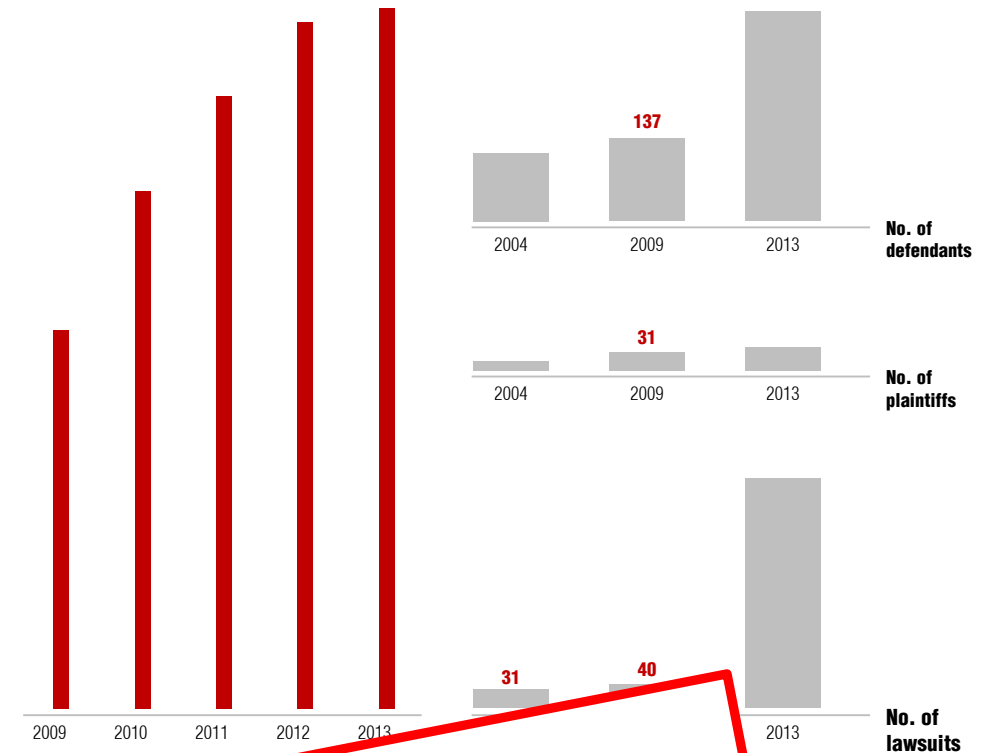
As competition in the automotive industry intensifies, top-tier automakers have chosen smart car technologies as their strategy for differentiating themselves from their competitors.

Competition in the automotive market is intensifying and as a result the gap between the leading pack and the followers has grown wider. The combined market share of the top 3 automakers – Toyota, GM and Volkswagen – was 31.5% in 2009 and by 2013 this had increased to 38.1% (2009). The market share of the 4th ~5th place automakers – Nissan, Hyundai and Ford – was 23.2% in 2009 and by 2013 this had decreased to 20.7% (2013).



● Proportion of patent lawsuits filed by NPEs
(NPEs/ Total)

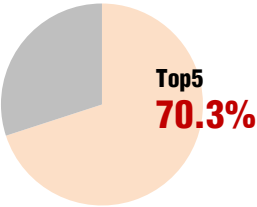
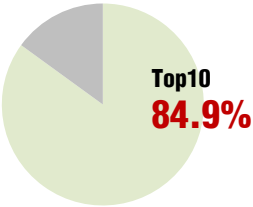
● Rapidly increasing smart car technology patent litigation



The leading automakers are increasingly using smart car technologies to differentiate themselves from their competitors. This has led to a rapid increase in smart car technology patent litigation. The number of lawsuits filed by NPEs (aka "patent trolls") instigating lawsuits sharply increased. And significantly, litigation has not been concentrated on only a few leading companies but has been filed across the entire automotive industry.

Change in the automotive market has led to a rapid increase in smart car technology patent litigation. The number of lawsuits involving smart cars began to increase rapidly in 2010 with the entry of NPEs (aka "patent trolls") instigating lawsuits sharply increased. And significantly, litigation has not been concentrated on only a few leading companies but has been filed across the entire automotive industry. Honda and BMW were involved in the greatest number of smart car technology patent lawsuits. The number of lawsuits launched against Hyundai+Kia began to increase in 2011. More than 90% of these smart car technology patent lawsuits were filed by NPEs.

Smart car technology patents are concentrated mostly in the Vehicle Control segment where 200 or so patents are registered each year.



Patent registration by smart car technology

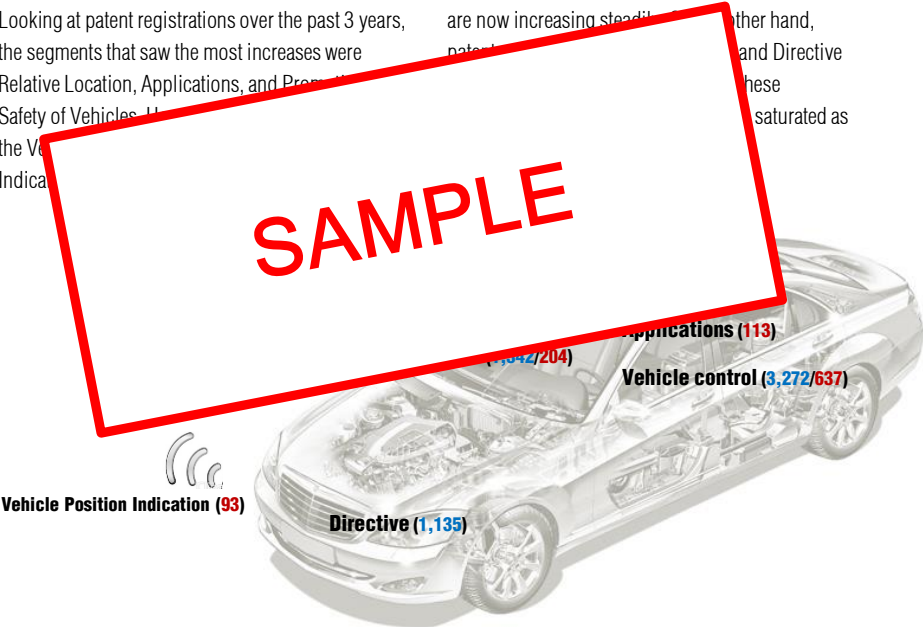
Name of technology

■ No. of patents (03~13)
■ No. of patents in the past 3 years

Vehicle Control	
Navigation	
Land Vehicle Alarms or Indicators	
Directive	
Vehicle Position Indication	
Relative Location	
Applications	
External Condition Vehicle-Mounted Indicator	
Transmission Control	
Vehicle Mounted Systems	
Promoting Safety of Vehicle	
Special Applications	
Single Channel Simultaneously	
Return Signal Controls External Device	
Controlling Operation Responsive	
Vehicle Detectors	
Image Superposition by Optical Means	
Positional Servo Systems	
Transmitter & Receiver	
Plural Engines	

The Relative Location, Applications and Special Applications segment saw patent registrations increase the most in the past three years.

Looking at patent registrations over the past 3 years, the segments that saw the most increases were Relative Location, Applications, and Promotional Safety of Vehicles. However, the Vehicle Position Indication segment is now increasing steadily. On the other hand, the segments that saw the most decreases were Directive and Vehicle Control. These segments are saturated as the market for these technologies matures.

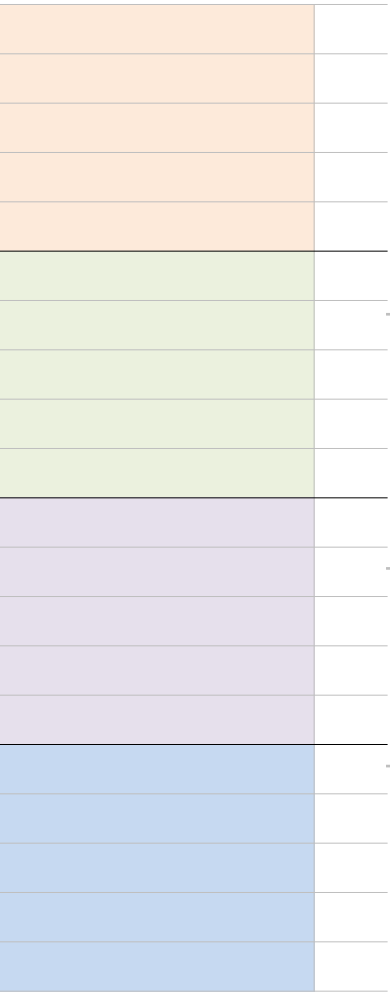


- Focus on the smart car field of patents (2003–2013)
- Focus on the smart car field of new patent (2011–2013)

Changes in smart car priorities

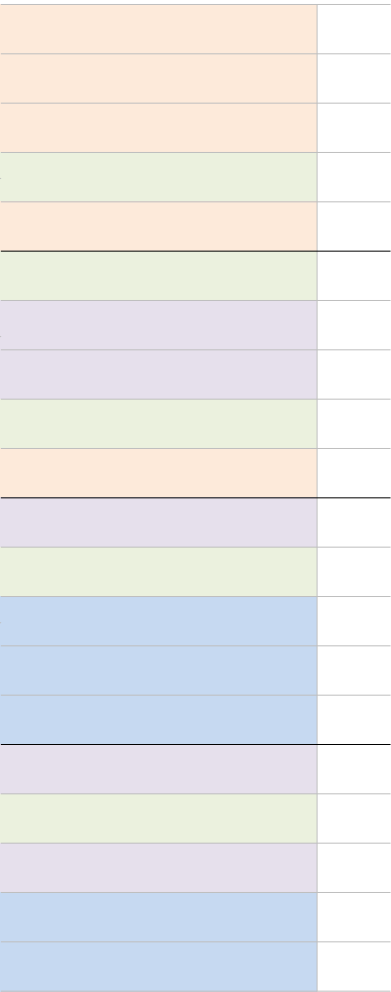
Segments where smart car patents are concentrated (2003–2013)

Name of technology



Segments where smart car patents are concentrated (2011–2013)

Name of technology





Top 9 Smart car Technologies 2014

Patent influence, IP activity and sharp rise in IP risk were taken into consideration, and top 9 core technologies that will change the dynamics of the smart car market were selected.

● Technologies with greater patent influence

Patent influence means the number of patents that are considered
technology priority and the number of patents that are considered
priority and the number of patents that are considered

Technology name	R&D priority		Proportion	
	All	Past 3 years	All	Past 3 years
Vehicle Control	1	1	29.0%	40.3%

● Technologies whose IP activity sharply increased

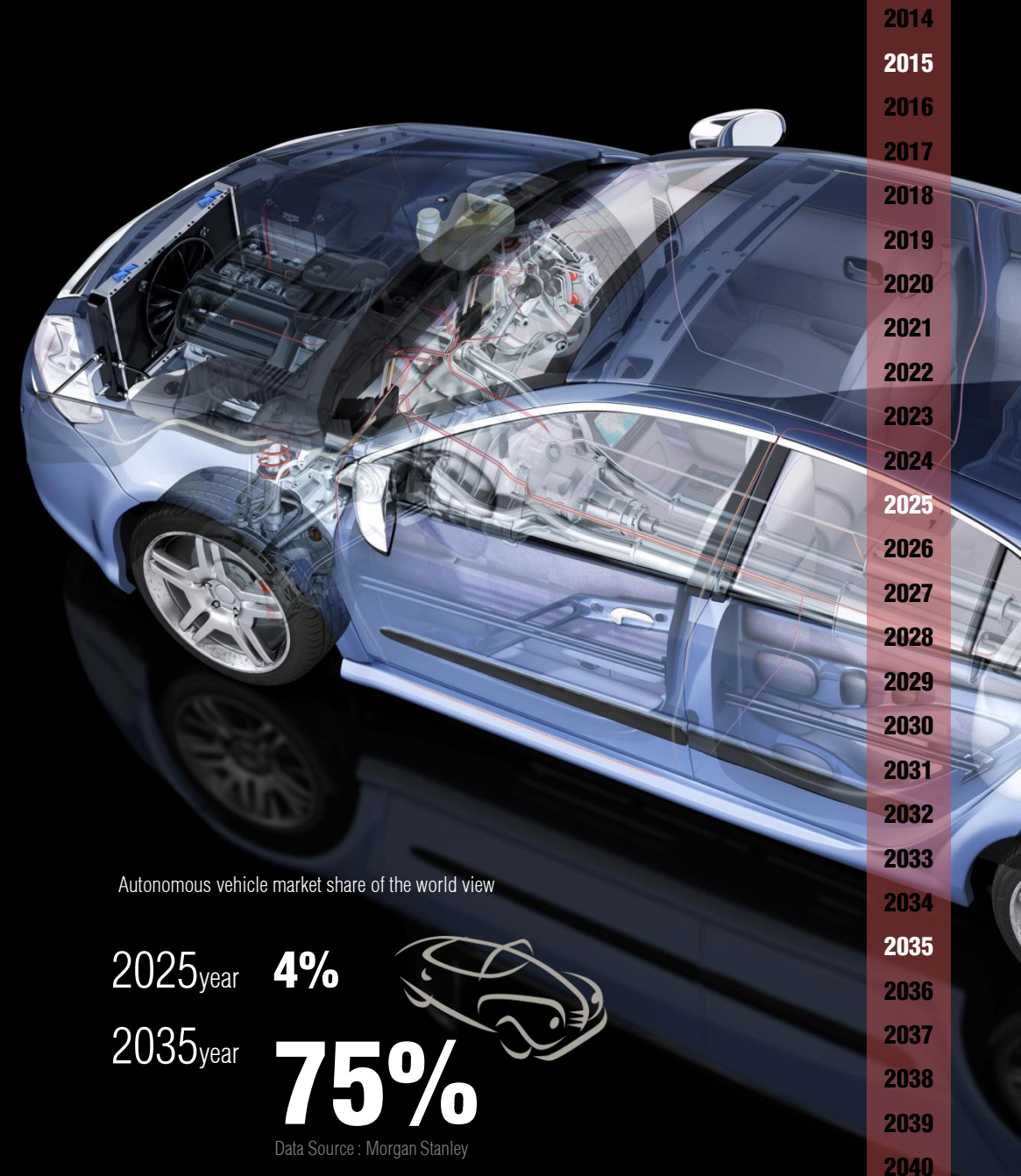
Patents with not only frequency but also frequency of IP activity of the
associated with the top 10 technologies among smart car
10 technologies with the top 10 transactions, i

technology	Technologies regarding which patent registrations sharply increased			Technologies regarding which patent transactions sharply increased		
	Past 3 years	Past 1 year	Proportion	Past 3 years	Past 1 year	Proportion
Relative Location	78	20	25.60%	18	8	44.40%

Technologies regarding which patent litigation occurs frequently or whose IP risk sharply increased became obstacles to corporate activities.

- **Technologies whose IP risk sharply increased**

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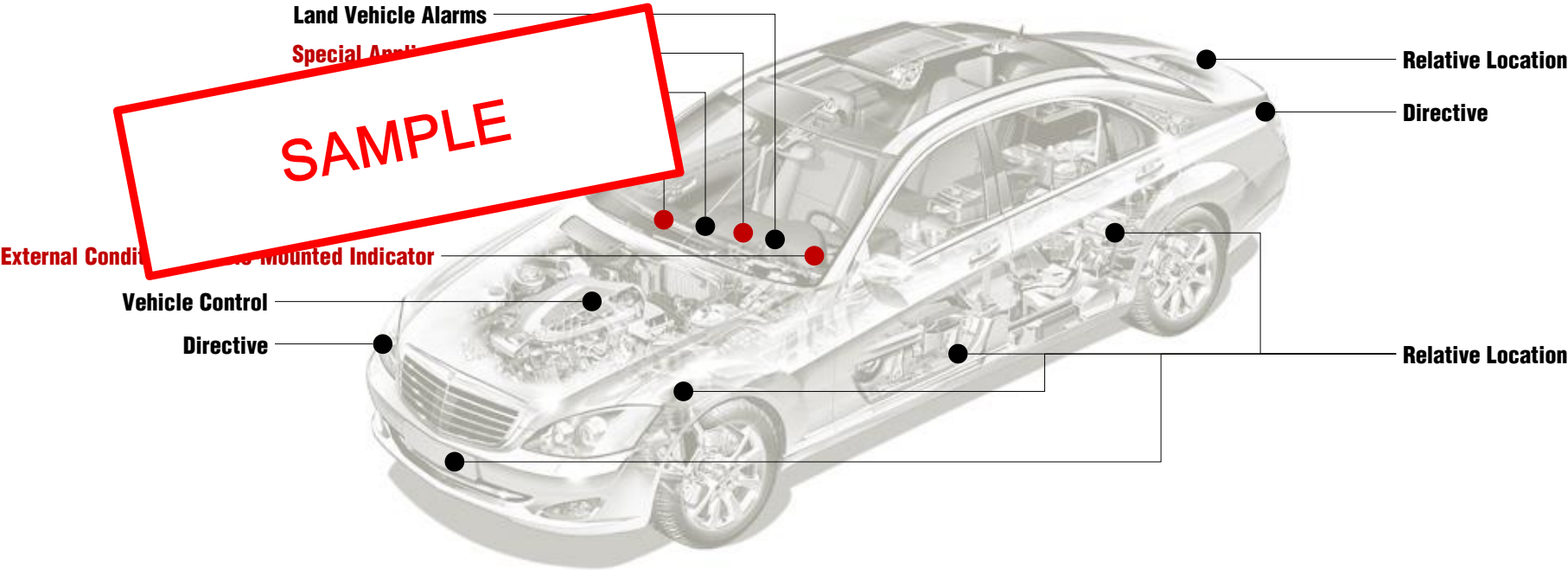
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Top 9 technologies picked from the viewpoint of IP are thought to be the core technologies that will change the dynamics of the smart car market this year.

There was the top 9 in all the technologies that have a high potential for commercialization risk. These top 9 technologies are thought to be the core technologies that will change the dynamics of the smart car market this year.

● Top 9 core smart car technologies of 2014

Technology	Description
Land Vehicle Alarms	
External Condition Vehicle-Mounted Indicator	
Vehicle Position Indicator	
Directive	
Special Applications	
Applications	
Vehicle Control	
Navigation	
Relative Location	



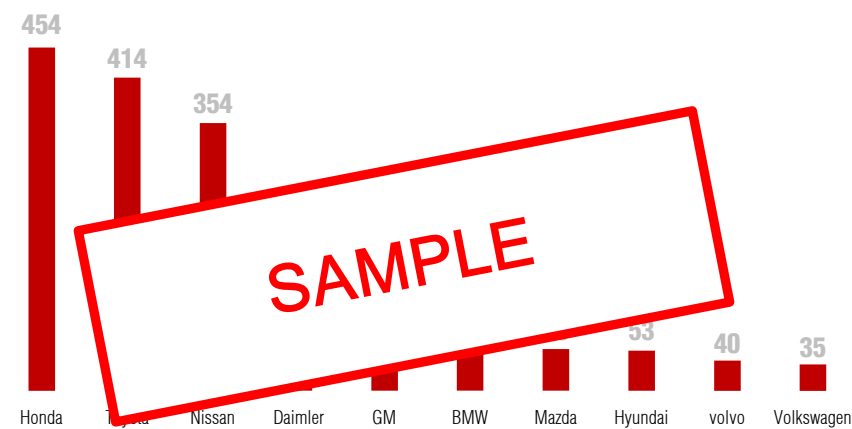


Evaluation of the smart car competitiveness of automakers

Honda has the most smart car patents and Toyota has been the most active recently.

To date, Honda has the most smart car patents, but Toyota has been the most active recently, securing 94 patents over the past 3 years.

● Number of smart car patents owned by automakers



● Number of smart car patents owned by automakers

Ranking	Vidor	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total	Post 3 years
1	Honda													
2	Toyota													
3	Nissan													
4	Daimler													
5	GM													
6	BMW													
7	Mazda													
8	Hyundai													
9	volvo													
10	Volkswagen													

These Figures apply to the USPC(US Patent and Trade Office) index.

IP quantity based on the number of patents, and IP quality based on the number of citations and patent activity were evaluated at the same time.

The competitiveness of automakers' smart car patents was evaluated using both a quantitative index and a qualitative index. IP quantity was measured based on the number of patents owned by automakers, while IP quality was evaluated in consideration of

- △ number of top 10% cited patents,
- △ top 10% citations, and
- △ patent activity during the past 3 years.

IP Quantity No. of patent registrations

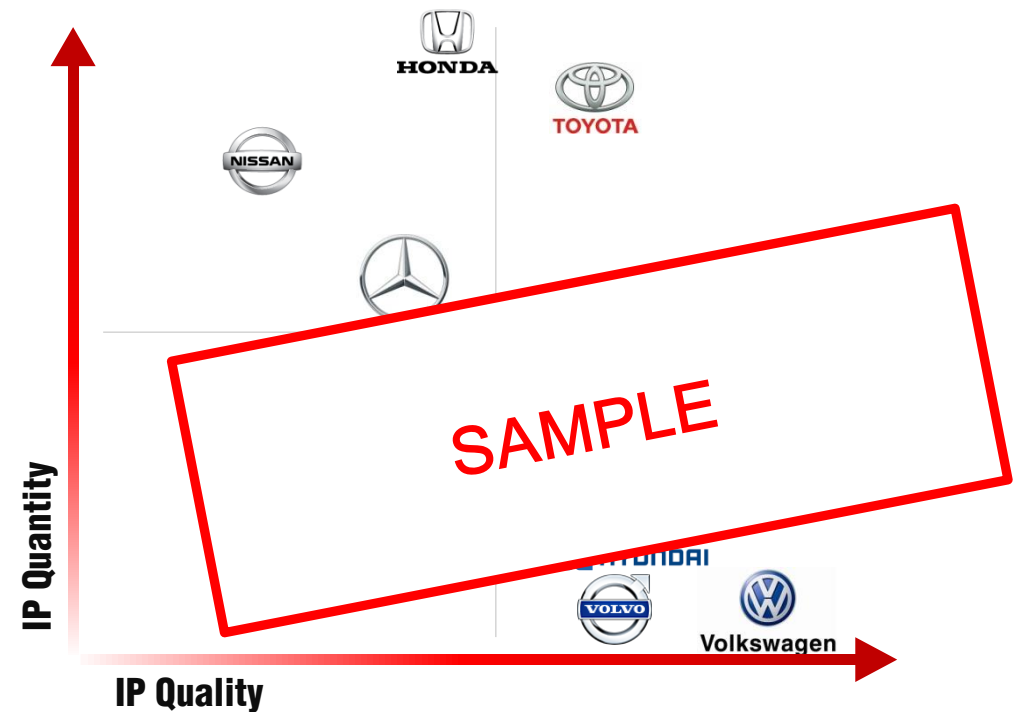
IP Quality

IP power + IP influence
improvement

- IP power
- IP influence
- Recent patent activity (past 3 years / total patents owned)
- Recent citations (number of citations of patents registered in the past 3 years)

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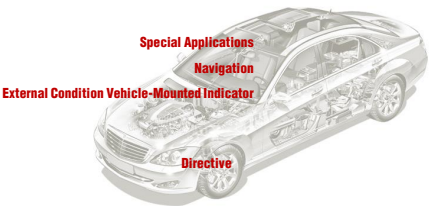
● Evaluation of the competitiveness of the smart car patents of the Top 10 automakers



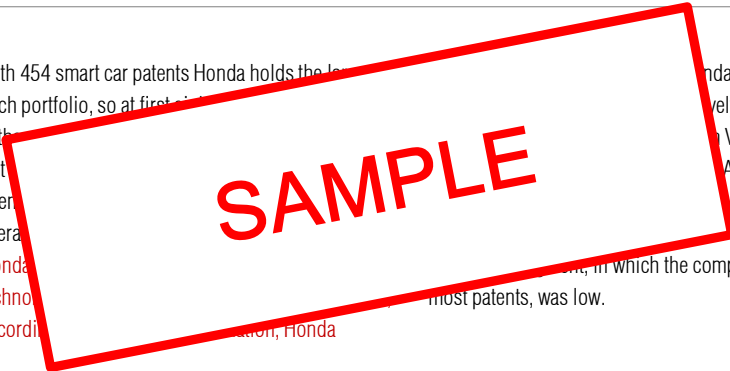


Analysis of the smart car competitiveness of automakers

Honda was rated as the automaker that has built the largest portfolio in terms of quantity.




With 454 smart car patents Honda holds the largest such portfolio, so at first sight it seems that Honda's patents are very and very valuable. But when we look at the Vehicle-Related Applications, we find that the qualitative value of the patents is low. For example, in the Vehicle Control and Navigation Applications, in which the company has the most patents, was low. According to the analysis, Honda



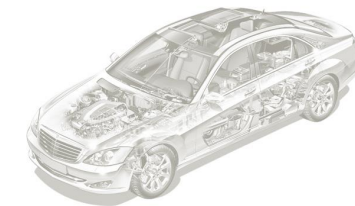
● Analysis of the competitiveness of Honda's smart car patents

	IP Quantity	IP Quality				
	No. of patent registrations	IP power	IP influence	Activity of recent patents	Qualitative improvement of recent patents	Total
Honda						
Avg. of top 10 vendors	180.7	0.065	0.425	0.164	0.021	0.674

● Analysis of the competitiveness of Honda's top 9 core smart car technologies

		IP Quantity		IP Quality				
		No. of patent registrations	Avg.	IP power	IP influence	Activity of recent patents	Qualitative improvement of recent patents	Total
Smart car core technology			140.2					0.649
	Land Vehicle Alarms		21					0.665
	External Condition Vehicle-Mounted Indicator		4.9					0.610
	Vehicle Position Indication		9.6					0.624
	Directive		15.2					0.537
	Special Applications		4.3					0.784
	Applications		5.8					0.617
	Vehicle Control		47.2					0.631
	Navigation		26.5					0.672
	Relative Location		5.7					0.695

Toyota's patents in the top 9 core smart car technologies are very competitive in general.




SAMPLE

- **Analysis of the competitiveness of Toyota's smart car patents**

	IP Quantity	IP Quality				
	No. of patent registrations	IP power	IP influence	Activity of recent patents	Qualitative improvement of recent patents	Total
Toyota						
Avg. of top 10 vendors	180.7	0.065	0.425	0.164	0.021	0.674

- **Analysis of the competitiveness of Toyota's top 9 core smart car technologies**

		IP Quantity		IP Quality					
		No. of patent registr ations	Avg.	IP power	IP influence	Activity of recent patents	Qualitative improve ment of recent patents	Total	Avg.
Smart car core technology			140.2						0.649
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	Vehicle Control		47.2						0.631
	Navigation		26.5						0.672
	Relative Location		5.7						0.695

Nissan's patents in the top 9 core smart car technologies grew faster quantitatively than qualitatively.




As Nissan has 354 smart car patents, the company scores very well quantitatively, but its qualitative scores are lower than those of the top 9 core smart car technologies. Nissan is competitive in terms of quantitative growth but their qualitative growth is weak.

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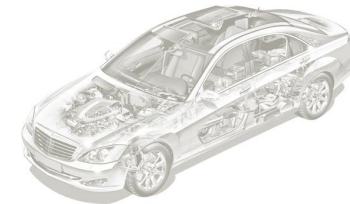
● Analysis of the competitiveness of Nissan's smart car patents

	IP Quantity	IP Quality				Total
	No. of patent registrations	IP power	IP influence	Activity of recent patents	Qualitative improvement of recent patents	
Nissan						
Avg. of top 10 vendors	180.7	0.065	0.425	0.164	0.021	0.674

● Analysis of the competitiveness of Nissan's top 9 core smart car technologies

		IP Quantity		IP Quality				
		No. of patent registrations	Avg.	IP power	IP influence	Activity of recent patents	Qualitative improvement of recent patents	Total
Smart car core technology			140.2					0.649
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	Relative Location		5.7					0.695

Daimler has not been so active recently but still has a strong smart car patent portfolio due to its previous accomplishments. Their efforts are seen as being quite distant from the core technologies.




SAMPLE

- **Analysis of the competitiveness of Daimler's smart car patents**

	IP Quantity	IP Quality				
	No. of patent registrations	IP power	IP influence	Activity of recent patents	Qualitative improvement of recent patents	Total
Daimler						
Avg. of top 10 vendors	180.7	0.065	0.425	0.164	0.021	0.674

- **Analysis of the competitiveness of Daimler's top 9 core smart car technologies**

		IP Quantity		IP Quality					
		No. of patent registrat ions	Avg.	IP power	IP influence	Activity of recent patents	Qualitative improve ment of recent patents	Total	Avg.
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	Applications		5.8						0.617
	Vehicle Control		47.2						0.631
	Navigation		26.5						0.672
	Relative Location		5.7						0.695

GM is the most active with regard to smart car patents and their qualitative level has been improving during the past 3 years as well.




GM is one of those companies which have been the most active with regard to smart car patents. Its qualitative level is higher than other companies in the industry. In relation to its core smart car technologies, GM is also positive in the Land Vehicle Alarms segments.

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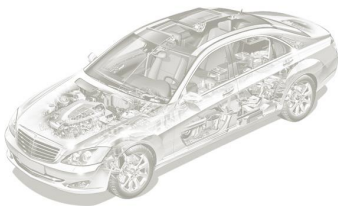
● Analysis of the competitiveness of GM's smart car patents

	IP Quantity	IP Quality				
	No. of patent registrations	IP power	IP influence	Activity of recent patents	Qualitative improvement of recent patents	Total
GM						
Avg. of top 10 vendors	180.7	0.065	0.425	0.164	0.021	0.674

● Analysis of the competitiveness of GM's top 9 core smart car technologies

		IP Quantity		IP Quality				
		No. of patent registrations	Avg.	IP power	IP influence	Activity of recent patents	Qualitative improvement of recent patents	Total
Smart car core technology			140.2					0.649
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	Relative Location		5.7					0.695

BMW has a relatively small number of patents but received a high qualitative evaluation score. However, their patents are concentrated in certain technology segments.



BMW has a relatively small number of smart car patents but received a high qualitative evaluation score. However, their patents are concentrated in certain technology segments. In order to get a more detailed analysis, we have conducted a relative analysis of BMW's smart car patents.

SAMPLE

● Analysis of the competitiveness of BMW's smart car patents

	IP Quantity	IP Quality				Total
	No. of patent registrations	IP power	IP influence	Activity of recent patents	Qualitative improvement of recent patents	
BMW						
Avg. of top 10 vendors	180.7	0.065	0.425	0.164	0.021	0.674

● Analysis of the competitiveness of BMW's top 9 core smart car technologies

		IP Quantity		IP Quality				
		No. of patent registrations	Avg.	IP power	IP influence	Activity of recent patents	Qualitative improvement of recent patents	Total
Smart car core technology			140.2					0.649
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	Directive		15.2					0.537
	Special Applications		4.3					0.784
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	Vehicle Control		47.2					0.631
	Navigation		26.5					0.672
	Relative Location		5.7					0.695

Mazda has too few core smart car technologies to say that it has a portfolio.



Mazda is ranked No. 7 in IP quantity, but No. 2 in IP quality. Mazda has a small number of patent registrations, but its total quality is high. Mazda's patent portfolio is concentrated in a few technologies. In particular, Mazda's patent portfolio is concentrated in the field of Vehicle Position technologies. In the field of Vehicle Position technologies, Mazda's patent portfolio is relatively active. It is far above the other automakers. It is also active in the field of Vehicle Position technologies. The number of patent registrations is small, but the quality is high. Mazda has a smart car patent portfolio.

SAMPLE

● Analysis of the competitiveness of Mazda's smart car patents

	IP Quantity	IP Quality				Total
	No. of patent registrations	IP power	IP influence	Activity of recent patents	Qualitative improvement of recent patents	
Mazda						
Avg. of top 10 vendors						

● Analysis of the competitiveness of Mazda's top 9 core smart car technologies

		IP Quantity		IP Quality				
		No. of patent registrations	Avg.	IP power	IP influence	Activity of recent patents	Qualitative improvement of recent patents	Total
Smart car core technology			140.2					0.649
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	Applications		5.8					0.617
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	Navigation		26.5					0.672
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Recently Hyundai has been very actively trying to gain competitiveness with regard to smart car patents. In particular, their patent strategy is focused on qualitative growth.



Hyundai has recently been very active in gaining competitiveness with regard to smart car patents. In particular, their patent strategy is focused on qualitative growth. Hyundai's patent portfolio is very high. The level of Hyundai's patents in navigation segments was high, and recently they have been active in getting patents in the Land Vehicle Alarms segment.

SAMPLE

● Analysis of the competitiveness of Hyundai's smart car patents

	IP Quantity	IP Quality				Total
	No. of patent registrations	IP power	IP influence	Activity of recent patents	Qualitative improvement of recent patents	
Hyundai						
Avg. of top 10 vendors	180.7	0.065	0.425	0.164	0.021	0.674

● Analysis of the competitiveness of Hyundai's top 9 core smart car technologies

		IP Quantity		IP Quality				
		No. of patent registrations	Avg.	IP power	IP influence	Activity of recent patents	Qualitative improvement of recent patents	Total
Smart car core technology			140.2					0.649
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	Relative Location		5.7					0.695

Volvo's smart car patents were not competitive both quantitatively and qualitatively.




Volvo's smart car patents were not competitive both quantitatively and qualitatively, but recently quantitative and qualitative performance patents in the smart car technology segments. Volvo's smart car patents were short of their competitors.

SAMPLE

● Analysis of the competitiveness of Volvo's smart car patents

	IP Quantity	IP Quality				Total
	No. of patent registrations	IP power	IP influence	Activity of recent patents	Qualitative improvement of recent patents	
Volvo						
Avg. of top 10 vendors	180.7	0.065	0.425	0.164	0.021	0.674

● Analysis of the competitiveness of Volvo's top 9 core smart car technologies

		IP Quantity		IP Quality				
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Smart car core technology			140.2					0.649
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	Navigation		26.5					0.672
	Relative Location		5.7					0.695

Volkswagen has the smallest number of smart car patents, but their qualitative level is quite high.




Volkswagen has only 35 smart car patents but the qualitative level of those 35 patents is quite high. In quantitative terms, Volkswagen is quite weak. Directive is excellent. Special Applications is quite weak. Relative Location is quite weak.

SAMPLE

● Analysis of the competitiveness of Volkswagen's smart car patents

	IP Quantity	IP Quality				Total
	No. of patent registrations	IP power	IP influence	Activity of recent patents	Qualitative improvement of recent patents	
Volkswagen						
Avg. of top 10 vendors	180.7	0.065	0.425	0.164	0.021	0.674

● Analysis of the competitiveness of Volkswagen's top 9 core smart car technologies








		IP Quantity		IP Quality				
		No. of patent registrations	Avg.	IP power	IP influence	Activity of recent patents	Qualitative improvement of recent patents	Total
Smart car core technology			140.2					0.649
 Volkswagen	Land Vehicle Alarms		21.0					0.665
	External Condition Vehicle-Mounted Indicator		4.9					0.610
	Vehicle Position Indication		9.6					0.624
	Directive		15.2					0.537
	Special Applications		4.3					0.784
	Applications		5.8					0.617
	Vehicle Control		47.2					0.631
	Navigation		26.5					0.672
	Relative Location		5.7					0.695



The Winner of 10 automaker in Smart car

The evaluation of the competitiveness of the core smart car technologies of the top 10 automakers shows that Japanese automakers (namely Honda, Toyota and Nissan) received relatively higher scores.

● Comparison of the core smart car technologies of the top 10 automakers

Comprehensive evaluation	 HONDA	 TOYOTA	 NISSAN			 VOLVO	
	Honda	Toyota				Volvo	Volkswagen
Land Vehicle Alarms							
External Condition Vehicle-Mounted Indicator							
Vehicle Position Indication							
Directive							
Special Applications							
Applications							
Vehicle Control							
Navigation							
Relative Location							

* Based on a relative comparison of the top 10 automakers

About Us



The Electronic Times is the most traditional and respected provider of information technology news and analysis in Korea.

Since 1982, The Electronic Times has grown to become the nation's largest and most extensive IT related newspaper and every technical expert and business man including top-level executives and policy makers have relied on The Electronic Times for acquiring speedy and accurate information they need.

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KGT Lab Co., Ltd. is a patent database, assessment and solutions company specializing in patent informatics.

Since its establishment in 2002, it has been the leading patent intelligence solutions provider in the market. The company launched Patent Rank (<http://rank.patentpia.com/about/outline.kgt>) in 2012, a total patent assessment service that provides recommendations for patent purchases, licensing targets and possible cooperative partnerships with other patent holders. In 2013, the lab released a comprehensive, global-standard patent database, the KGT Database (<http://patentpia.com/db/data.kgt>), fully utilizing its extensive research and development over the past ten years. The database achieved "Database Quality Certification-Value" issued by Korea Database Agency. The company also provides KGT Report, a service created for producing tailor-made reports for inquiring customers.



Appendix

* Patent Registration by smart car technology

Name of Technology	1985	1994	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total	Past 3 Years
Vehicle Control, Guidance, Operation, Or Indication																						
Navigation																						
Land Vehicle Alarms or Indicator																						
Directive																						
Vehicle Position Indication																						
Relative Location																						
Application																						
External Condition Vehicle-Mounted Indicator																						
Transmission Control																						
Vehicle Mounted System																						
Promotion																						
Speed																						
Singl																						
Return																						
Control																						
Vehicle C																						
Image Sup by Optical Means																						
Positional Servo System																						
Transmitter & Receiver																						
Plural Engines																						
With Means Responsive To Speed Of Vehicle For Maintaining Speed At, Or Preventing It From Exceeding, A Particular Value																						
Condition Responsive Indicating System																						
Radiotelephone System																						
Selective																						
Vehicle Parking Indicators																						
Receiver Or Analog Modulated Signal Frequency Converter																						
Electric Engine																						
Speech Signal Processing																						

* Patent litigation by smart car technology

Name of Technology	Total	Past 3 Years	Past 1 Year
Navigation			
Vehicle Position Indication			
Directive			
Radiotelephone System			
Land Vehicle Alarms Or Indicators			
Vehicle Control, Guidance, Operation, Or Indication			
Relative Location			
Visual Indication			
Transmitter And Receiver At Same Station			
Condition Responsive Indicating System			
With Means For Promoting Safety Of Vehicle, Its Occupant Or Load, Or An External Device			
Vehicle Mounted Systems			
Special Applications			
Support Systems			
Selection Systems			
Special Applications			
Vehicle Mounted Systems			
External Systems			
Image Sensing Systems			
Applications			
Crash Sensing Systems			
Positional Servo Systems (E.G., Servomechanisms)			
Speech Signal Processing			
Automated Electrical Financial Or Business Practice Or Management Arrangement			
Video Display Screen Support			
Display Peripheral Interface Input Device			
Image Transformation Or Preprocessing			
Photocells; Circuits And Apparatus			
Power			
Receiver Or Analog Modulated Signal Frequency Converter			
Return Signal Controls External Device			
Special Application			
Traffic Control Indicator			
Transmission Control			
Vehicle Parking Indicators			
With Means For Controlling Operation Responsive To Electromagnetic Radiation, Magnetic Force, Or Sound Waves Received From Source, Or Reflected From Object Or Surface, Located Apart From Vehicle			

SAMPLE



SAMPLE

*Analysis of the competitiveness of Honda’s smart car patents

	No. of patent registrations	No. of registered patents in the past 3years	Total citations	No. of citations of patents registered in the past 3 years	No. of top 10% cited patents	Top 10% citations	IP Power	IP Influence	Activity of recent patents	Qualitative improvement of recent patents	IP Quality
Honda											

*Analysis of the competitiveness of Honda’s top 9 core smart car technologies

	No. of patent registrations	No. of registered patents in the past 3years	Total citations	No. of citations of patents registered in the past 3 years	No. of top 10% cited patents	Top 10% citations	IP Power	IP Influence	Activity of recent patents	Qualitative improvement of recent patents	IP Quality
Top 9 core smart car technology											
Land Vehicle Alarms											
External Condition Vehicle-Mounted Indicator											
Vehicle Position Indication											
Directive											
Special Applications											
Application											
Vehicle Control											
Navigation											
Relative Location											



SAMPLE

*Analysis of the competitiveness of Toyota’s smart car patents

	No. of patent registrations	No. of registered patents in the past 3years	Total citations	No. of citations of patents registered in the past 3 years	No. of top 10% cited patents	Top 10% citations	IP Power	IP Influence	Activity of recent patents	Qualitative improvement of recent patents	IP Quality
Toyota											

*Analysis of the competitiveness of Toyota’s top 9 core smart car technologies

	No. of patent registrations	No. of registered patents in the past 3years	Total citations	No. of citations of patents registered in the past 3 years	No. of top 10% cited patents	Top 10% citations	IP Power	IP Influence	Activity of recent patents	Qualitative improvement of recent patents	IP Quality
Top 9 core smart car technology											
Land Vehicle Alarms											
External Condition Vehicle-Mounted Indicator											
Vehicle Position Indication											
Directive											
Special Applications											
Application											
Vehicle Control											
Navigation											
Relative Location											



SAMPLE

*Analysis of the competitiveness of Nissan’s smart car patents

	No. of patent registrations	No. of registered patents in the past 3years	Total citations	No. of citations of patents registered in the past 3 years	No. of top 10% cited patents	Top 10% citations	IP Power	IP Influence	Activity of recent patents	Qualitative improvement of recent patents	IP Quality
Nissan											

*Analysis of the competitiveness of Nissan’s top 9 core smart car technologies

	No. of patent registrations	No. of registered patents in the past 3years	Total citations	No. of citations of patents registered in the past 3 years	No. of top 10% cited patents	Top 10% citations	IP Power	IP Influence	Activity of recent patents	Qualitative improvement of recent patents	IP Quality
Top 9 core smart car technology											
Land Vehicle Alarms											
External Condition Vehicle-Mounted Indicator											
Vehicle Position Indication											
Directive											
Special Applications											
Application											
Vehicle Control											
Navigation											
Relative Location											



SAMPLE

*Analysis of the competitiveness of Daimler’s smart car patents

	No. of patent registrations	No. of registered patents in the past 3years	Total citations	No. of citations of patents registered in the past 3 years	No. of top 10% cited patents	Top 10% citations	IP Power	IP Influence	Activity of recent patents	Qualitative improvement of recent patents	IP Quality
Daimler											

*Analysis of the competitiveness of Daimler’s top 9 core smart car technologies

	No. of patent registrations	No. of registered patents in the past 3years	Total citations	No. of citations of patents registered in the past 3 years	No. of top 10% cited patents	Top 10% citations	IP Power	IP Influence	Activity of recent patents	Qualitative improvement of recent patents	IP Quality
Top 9 core smart car technology											
Land Vehicle Alarms											
External Condition Vehicle-Mounted Indicator											
Vehicle Position Indication											
Directive											
Special Applications											
Application											
Vehicle Control											
Navigation											
Relative Location											



SAMPLE

*Analysis of the competitiveness of GM’s smart car patents

	No. of patent registrations	No. of registered patents in the past 3years	Total citations	No. of citations of patents registered in the past 3 years	No. of top 10% cited patents	Top 10% citations	IP Power	IP Influence	Activity of recent patents	Qualitative improvement of recent patents	IP Quality
GM											

*Analysis of the competitiveness of GM’s top 9 core smart car technologies

	No. of patent registrations	No. of registered patents in the past 3years	Total citations	No. of citations of patents registered in the past 3 years	No. of top 10% cited patents	Top 10% citations	IP Power	IP Influence	Activity of recent patents	Qualitative improvement of recent patents	IP Quality
Top 9 core smart car technology											
Land Vehicle Alarms											
External Condition Vehicle-Mounted Indicator											
Vehicle Position Indication											
Directive											
Special Applications											
Application											
Vehicle Control											
Navigation											
Relative Location											



SAMPLE

*Analysis of the competitiveness of BMW’s smart car patents

	No. of patent registrations	No. of registered patents in the past 3years	Total citations	No. of citations of patents registered in the past 3 years	No. of top 10% cited patents	Top 10% citations	IP Power	IP Influence	Activity of recent patents	Qualitative improvement of recent patents	IP Quality
BMW											

*Analysis of the competitiveness of BMW’s top 9 core smart car technologies

	No. of patent registrations	No. of registered patents in the past 3years	Total citations	No. of citations of patents registered in the past 3 years	No. of top 10% cited patents	Top 10% citations	IP Power	IP Influence	Activity of recent patents	Qualitative improvement of recent patents	IP Quality
Top 9 core smart car technology											
Land Vehicle Alarms											
External Condition Vehicle-Mounted Indicator											
Vehicle Position Indication											
Directive											
Special Applications											
Application											
Vehicle Control											
Navigation											
Relative Location											



SAMPLE

*Analysis of the competitiveness of Mazda’s smart car patents

	No. of patent registrations	No. of registered patents in the past 3years	Total citations	No. of citations of patents registered in the past 3 years	No. of top 10% cited patents	Top 10% citations	IP Power	IP Influence	Activity of recent patents	Qualitative improvement of recent patents	IP Quality
Mazda											

*Analysis of the competitiveness of Mazda’s top 9 core smart car technologies

	No. of patent registrations	No. of registered patents in the past 3years	Total citations	No. of citations of patents registered in the past 3 years	No. of top 10% cited patents	Top 10% citations	IP Power	IP Influence	Activity of recent patents	Qualitative improvement of recent patents	IP Quality
Top 9 core smart car technology											
Land Vehicle Alarms											
External Condition Vehicle-Mounted Indicator											
Vehicle Position Indication											
Directive											
Special Applications											
Application											
Vehicle Control											
Navigation											
Relative Location											



SAMPLE

*Analysis of the competitiveness of Hyundai’s smart car patents

	No. of patent registrations	No. of registered patents in the past 3years	Total citations	No. of citations of patents registered in the past 3 years	No. of top 10% cited patents	Top 10% citations	IP Power	IP Influence	Activity of recent patents	Qualitative improvement of recent patents	IP Quality
Hyundai											

*Analysis of the competitiveness of Hyundai’s top 9 core smart car technologies

	No. of patent registrations	No. of registered patents in the past 3years	Total citations	No. of citations of patents registered in the past 3 years	No. of top 10% cited patents	Top 10% citations	IP Power	IP Influence	Activity of recent patents	Qualitative improvement of recent patents	IP Quality
Top 9 core smart car technology											
Land Vehicle Alarms											
External Condition Vehicle-Mounted Indicator											
Vehicle Position Indication											
Directive											
Special Applications											
Application											
Vehicle Control											
Navigation											
Relative Location											



SAMPLE

*Analysis of the competitiveness of Volvo’s smart car patents

	No. of patent registrations	No. of registered patents in the past 3years	Total citations	No. of citations of patents registered in the past 3 years	No. of top 10% cited patents	Top 10% citations	IP Power	IP Influence	Activity of recent patents	Qualitative improvement of recent patents	IP Quality
Volvo											

*Analysis of the competitiveness of Volvo’s top 9 core smart car technologies

	No. of patent registrations	No. of registered patents in the past 3years	Total citations	No. of citations of patents registered in the past 3 years	No. of top 10% cited patents	Top 10% citations	IP Power	IP Influence	Activity of recent patents	Qualitative improvement of recent patents	IP Quality
Top 9 core smart car technology											
Land Vehicle Alarms											
External Condition Vehicle-Mounted Indicator											
Vehicle Position Indication											
Directive											
Special Applications											
Application											
Vehicle Control											
Navigation											
Relative Location											



SAMPLE

*Analysis of the competitiveness of Volkswagen's smart car patents

	No. of patent registrations	No. of registered patents in the past 3years	Total citations	No. of citations of patents registered in the past 3 years	No. of top 10% cited patents	Top 10% citations	IP Power	IP Influence	Activity of recent patents	Qualitative improvement of recent patents	IP Quality
Volkswagen											

*Analysis of the competitiveness of Volkswagen's top 9 core smart car technologies

	No. of patent registrations	No. of registered patents in the past 3years	Total citations	No. of citations of patents registered in the past 3 years	No. of top 10% cited patents	Top 10% citations	IP Power	IP Influence	Activity of recent patents	Qualitative improvement of recent patents	IP Quality
Top 9 core smart car technology											
Land Vehicle Alarms											
External Condition Vehicle-Mounted Indicator											
Vehicle Position Indication											
Directive											
Special Applications											
Application											
Vehicle Control											
Navigation											
Relative Location											