



Mercedes-Benz

Fighting Driver Distraction

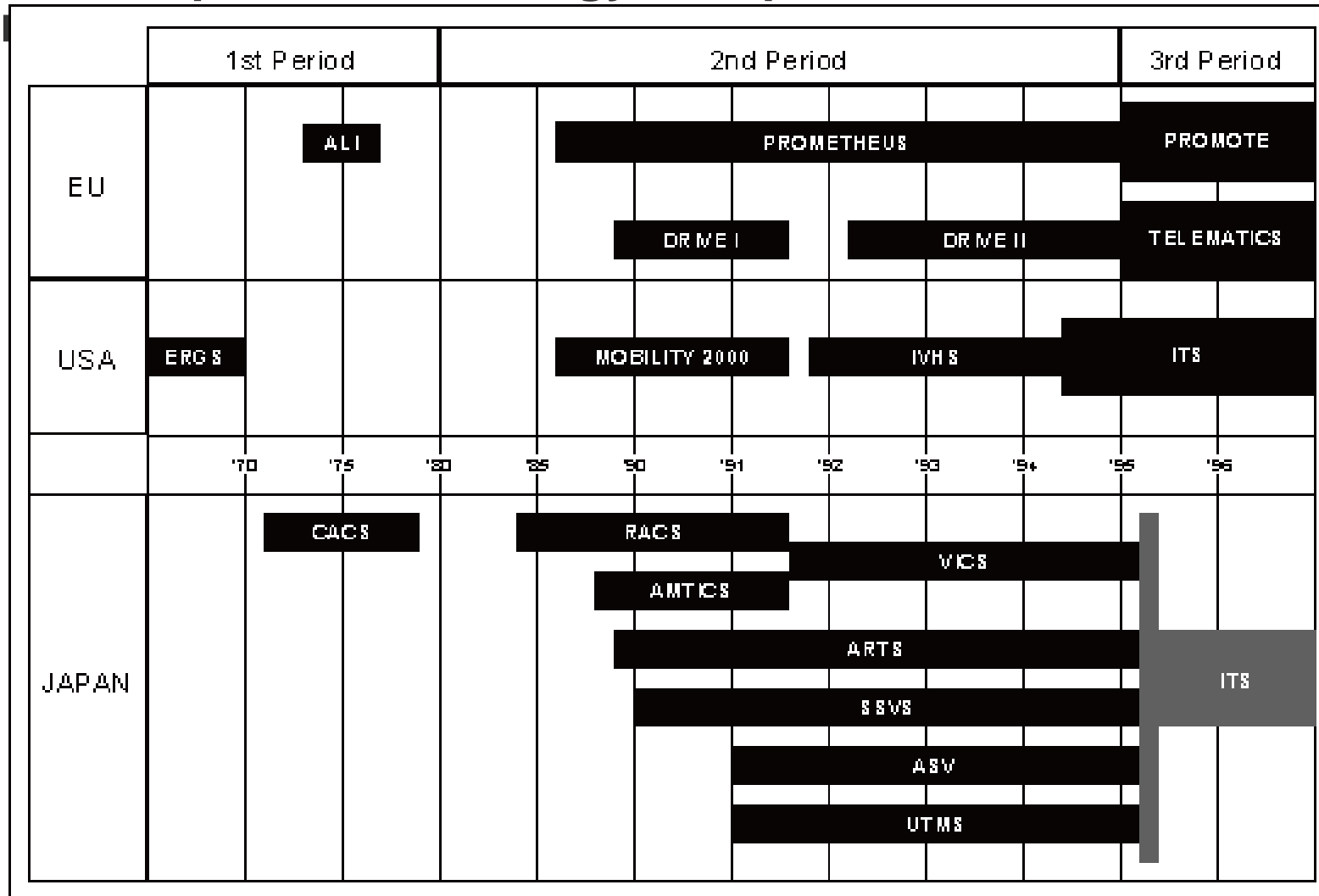
Industry Efforts

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The early days ... ITS Development Chronology in Japan, the U.S. and Eu





PROMETHEUS was initiated in 1985 with the purpose to develop the European traffic scenario of the future with improved safety, environment and efficiency.

Within this group the need for international standardisation of HMI topics was realised and groups on European (CEN TC278 WG10) and international level (ISO TC22, SC13 WG8) were established

Members come from car manufacturers, suppliers, universities and research institutes

The working group meets twice a year.

Preparatory work is conducted in Taskforces convened by the Project leaders. These meet on two days before the WG session, often in parallel meetings

Liaison with ISO/TC 204/WG14 (Assistance systems) and ISO/TC 204/WG17 (Integration of mobile and nomadic devices).



International Standards for Automotive HMI

ISO 15005	Dialog management
ISO 15006	Auditory information
ISO 15007	Measurement of visual behaviour
ISO 15008	Visual presentation of information
ISO 16951	Procedures for determining priority
ISO 16673	Occlusion method to assess visual demand
ISO 26022	Lane change test
ISO 2575	Symbols



Development and compliance with regional guidelines

Document	Developed by	Signed by
JAMA Guideline	Japan Automobile Manufacturers Association (JAMA)	JAMA
European Statement of Principles (ESoP)	Expert Group tasked by European Commission	European Automobile Manufacturers' Association (ACEA)
AAM Guideline	Alliance of Automotive Manufacturers (AAM)	AAM



Publication dates of the guidelines

Document	1. version	2.version	3.version
JAMA Guideline	1990	2000	2004
ESoP	2000	2006	2008
AAM Guideline	2003	2006	2006



Comparison of the regional guidelines (1)

Content	ESoP	AAM	JAMA
Correct installation	X	X	X
Drivers field of view	X	X	X
Obstruction of displays and controls	X	X	X
Driving posture			X
Close to the drivers line of sight	X	X	X
Glare and reflections	X	X	X
Display at night			X
Symbols	X	X	X
Legibility			
- Contrast	X	X	X
- Size of characters	X	X	X
- Font dimensions	X	X	X
- Blinking	X	X	X
Audibility	X		X
Timeliness and accuracy of information	X	X	



Comparison of the regional guidelines (2)

Content	ESoP	AAM	JAMA
Prioritization	X		
Information which impairs the safety and smooth flow of road traffic			X
No Uncontrollable Sound	X	X	X
At least one hand on the steering wheel	X	X	X
Chunkability	X	X	X
Resumeability	X	X	X
Driver paced	X	X	X
Handsfree speech		X	
Timely feedback	X	X	X
Visual Information can be switched off	X	X	X
No TV or scrolling Text	X	X	X
No functional interference	X		
Locked during driving	X	X	X
Malfunction notification	X	X	



Measurement of Glance time



Method	Glance Behaviour	Occlusion
Standard	ISO 15007	ISO 16673
Physical property	Total glance time	Total shutter open time
AAM	20 sec	15 sec
JAMA	8 sec	7.5 sec

But: Age groups have different definitions:

AAM: between 45 and 65

JAMA: between 20 and 49



Determination of distraction by measuring driving performance

In the AAM guideline determining driving performance is used as an alternative to measuring glance behavior



- Test can be performed on the road, on a test track or in a driving simulator
- Two tasks are carried out in parallel: Following the car ahead and operating the application under test
- Lane exceedences and variation of headway are used as measures for driving quality.
- The same procedure is done for manual radio tuning as a reference task.
- If the driving performance while operating the application under test is significantly worse than that of the reference task the application is not allowed while driving



NHTSA Guideline

The NHTSA is much more restrictive compared to the AAM guideline

But: NHTSA Guideline has no influence on

- Nomadic devices
- Entering text messages

NHTSA Guideline makes integrated OEM devices less attractive

-> Driver will switch to nomadic devices

Overall influence on safety will be negative



Minor issuses

AAM/JAMA Different age groups for testing of visual behaviour

Canada Requirement for French language on buttons etc.

Hongkong TV/Video also not allowed while standing

USA Different laws in the states



Integration of nomadic devices

MirrorLink is a standard that gives an application running on a smartphone access to the display and controls of the car. By digital certificate it is guaranteed that only certified applications can be used while driving.



The Car Connectivity Consortium takes beside hardware and software standardisation the following steps regarding driver distraction:

- Adopts the regional guidelines (AAM, JAMA, ESoP)
- Develops handbooks and guidelines to support the software developer in understanding the needs of automotive HMI
- Establishes a certification process to proof compliance with regional guidelines



Conclusion

- Standards and guidelines have a great similarity due to international cooperation
- Main discrepancies are due to cultural differences

Ongoing and Future Work

- Incorporate results of new research, especially Naturalistic Driving Studies
- Develop standard for integration of nomadic devices



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