

# An ergonomic approach to on-board systems

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## Abstract

Without doubt the driver is central in automotive ergonomics. Sensory input, cognitive processes, habits, and emotions all play a role in using on-board products and services while driving. Drivers have to manage these two demanding concurrent tasks: driving the vehicle and performing activities more or less related to driving itself. At the same time, the driver has to take into account the environment which dynamically changes with changing traffic situations, weather conditions, ambient light and road type.

In this paper a brief overview of the Cognitive Ergonomics group activities of the Centro Ricerche Fiat are presented. Focus is on applied research on users' expectations, needs, habits, and perceptual and cognitive processes involved in the use of on-board systems while driving. Aim is to contribute to the designing process and to improve on-board devices and services usability, enhancing driving safety and minimising driver distraction.

## Introduction

The ergonomic approach taken depends on the context in which the system to be evaluated will be used (ISO 9241-11). As the driving context is very complex, it is important to describe it accurately. Central element is man, described, from the Cognitive Ergonomics point of view, in terms of sensations and perceptions, cognitive processes, habits, motivations, emotions.

Moreover, transportation context is complicated by the fact that nowadays, drivers have the possibility to interact with products and services while driving their cars. The context is actually a dual-tasks one, in which driver's cognitive resources have to be allocated to at least two different tasks that may interfere one to the other in different more or less unexpected ways.

In particular, drivers interact with the vehicle using both primary and secondary controls, they acquire information relative to the vehicle, controlling its

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