

# WoMan-machine interface (WMMI)?

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It is common and well-accepted knowledge that a “man”-machine interface (MMI) refers to a human-machine interface, one that is not necessarily gender specific, but focused on the user’s experience and interaction. But let us “face” it; statistically, the field of robot developers is predominantly male, as well as the users of industrial robotics, which are also comprised overwhelmingly by the male population.

I remember trying to use a pendant when I sold industrial robots in the mid-1990s. It was a good thing I never had to use my company’s E-stop button on the factory floor. It required one hand around the pendant and the other on the E-stop simultaneously, but one of my hands would not fit around the pendant. I am smaller than the average woman and hardly fit the hand-size norm of an industrial robot operator, but I needed two hands to operate the pendant designed for one-hand.

As robots move from the industrial setting to service environments, the MMI should and once again be geared to the primary end-user. In addition to being well designed, it should be physically appealing. When I received my Sony AIBO in 1999, my first consumer robot, my initial interaction with my new AIBO was to insert the AIBO’s memory stick. Though it was a brilliant functionality design, the “inter-face” turned out to be more like an “inter-rear” as that was the place in the robot dog that it received its “brains” (Figure 1). Though it was not the way I had anticipated my first contact with my new AIBO, I speculate that females and children (Sony-recommended age nine years and older) were the minority users.



**Figure 1** An inter-face or an inter-rear?

According to recent statistics, women are the primary decision makers of household purchases. Thus, we can expect women to be both the primary purchasers and end-users of robots in the home. The future of woman-machine interaction and cooperation with household and humanoid robots will undoubtedly feature a multi-modal interface with visual, audio, gesture and other sensory communication. How humans interface with other humans will most likely be the basis for the development of human-robot interactions (which leads me to my next thoughts, “Will we have more direct communication with our robots of the future than with other humans? Don’t most of us already spend more time interfacing with our computers than we spend face-to-face with other humans?”).

From a purchasing perspective, is the MMI even considered to be an important criterion when it comes to purchasing a robot system, or does it have more influence on future robot buying decisions? How important is the MMI for the overall robot system’s success?

It seems to me that a good MMI design requires a proper understanding of the user’s needs prior to commercialization. Therefore, I pose the following questions:

- Who will be buying your robot?
- Who will be using the MMI?
- What criterion is important to the user (e.g. intuitive, easy-to-operate, etc.)?
- What experiences with other MMIs or robot systems does the user have and how will these influence their current usability and expectations?
- What are the functionality requirements, including safety?
- What type of interface design(s) appeals to the user?
- Can usability testing on prototypes be conducted to obtain user feedback?
- Is there, and should there be, a formal and systematic approach for validating MMIs?

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