The role of human machine interaction in the development and implementation of NDT 4.0

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The use of artificial intelligence (AI) in designing technological systems is currently omnipresent. Non-destructive testing (NDT) is one of the disciplines that is striving to profit from that technology to increase its reliability as well as the safety and productivity of the industries it is applied in. Human-machine interaction (HMI), a recognized key area within the Industry 4.0, plays an important role in the design, development, acceptance and the successful implementation of these systems. There is no doubt that with the use of AI, the NDT task will significantly change. This technology will not eliminate people from the NDT process, but fundamentally change the nature of the task and of the knowledge and skills required for NDT to be carried out reliably. Therefore, the challenges and possible risks associated with this new application need to be identified. This requires understanding and development of a new NDT paradigm. This paper will address the changing role of NDT inspectors in NDT 4.0 and address the expected new task demands, discuss possibly arising problems and suggest ways for implementing AI-driven systems into the practice successfully. Thereby it will discuss the implications of usability and user-centred design for the development and subsequent acceptance of new technologies and suggest a conceptual framework that will allow for addressing the AI-related challenges effectively. The aim is to raise the awareness of the importance of user-centred approach in adopting new technologies into current NDT practices.