

Sound quality issues and methods in Information Technology product design, development and manufacture

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Information Technology (IT) products form an increasing part of working, residential and recreational life. While their absolute sound levels have decreased, customer sensitivity toward their general noise character, patterns and transient events has increased. Sound quality (SQ) is becoming increasingly recognized as influencing decisions about product quality, lifestyle and purchase, and must be considered a design factor. We will discuss strategies, tools and methods for designing, quantifying, measuring and managing IT product SQ according to human perception considering transient events, time-varying tonal frequencies and levels, and the nonlinear human sensitivity to short-term variation (pattern) relative to steady or more slowly-varying sound levels or frequencies. Simple tools such as varying the integration time of level vs. time measurement and subjectively determining frequency bands in which to measure are productive. They can and should be combined with advanced psychoacoustic tools such as a hearing model and a pattern-extraction technique, and with binaural transfer path analysis and simulation to consider source- and path-related contributions for predicting and ensuring appropriate SQ in design and manufacture. The paper will also suggest coordinating SQ factors with existing industry methods characterizing and reporting IT acoustic parameters.