Recent advances in 3D scanning technologies have opened new possibilities in a broad range of applications including cultural heritage, medicine, civil engineering, and urban planning. Virtual Reality systems can provide new tools to professionals that want to understand acquired 3D models. In this review paper, we analyze the concept of data comprehension with an emphasis on visualization and inspection tools on immersive setups. We claim that in most application fields, data comprehension requires model measurements, which in turn should be based on the explicit visualization of uncertainty. As 3D digital representations are not faithful, information on their fidelity at local level should be included in the model itself as uncertainty bounds. We propose the concept of Measurable 3D Models as digital models that explicitly encode such local uncertainty bounds. We claim that professionals and experts can strongly benefit from immersive interaction through new specific, fidelity-aware measurement tools, which can facilitate 3D data comprehension. Since noise and processing errors are ubiquitous in acquired datasets, we discuss the estimation, representation, and visualization of data uncertainty. We show that, based on typical user requirements in Cultural Heritage and other domains, application-oriented measuring tools in 3D models must consider uncertainty and local error bounds. We also discuss the requirements of immersive interaction tools for the comprehension of huge 3D and nD datasets acquired from real objects.