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how a finite element analysis fea workflow looks like and how it is used in the industry analyzing a model created with fem is called finite element analysis or fea the two terms fem and fea are often used interchangeably this article introduces the concepts of fem and how it's used to solve a wide variety of real world problems what exactly is fem the finite element method fem is the dominant discretization technique in structural mechanics the basic concept in the physical interpretation of the fem is the subdivision of the mathematical model into disjoint non overlapping components of simple geometry called finite elements or elements for short the finite element analysis fea is the simulation of any given physical phenomenon using the numerical technique called the finite element method fem engineers use fea software to reduce the number of physical prototypes and experiments and optimize components in their design phase to develop better products faster while saving on expenses 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