This work focuses on the study of RF MEMS dynamic Pull-in/Pull-out. We have successfully created a framework for dynamic pull-in instability phenomenon by creating a compact and efficient 1D FEM using Euler Bernoulli Beam theory in MATLAB and studied theory of physics involved in modelling structural dynamics and electro-mechanics. We investigated various techniques of modelling contact rigid body mechanics and found out that a fast spring force with damper is the best contact model for fast and stable inelastic contact. We investigated and incorporated a compact physics based Quantum Tunneling Model and found the total charge accumulated in one cycle. A physics based quantum tunnelling model needs to be used for life cycle analysis. We now need to devise a curve fitting compact and time efficient algorithmic framework for predicting failure without actually simulating the deterministic physics based model for billions of cycles.