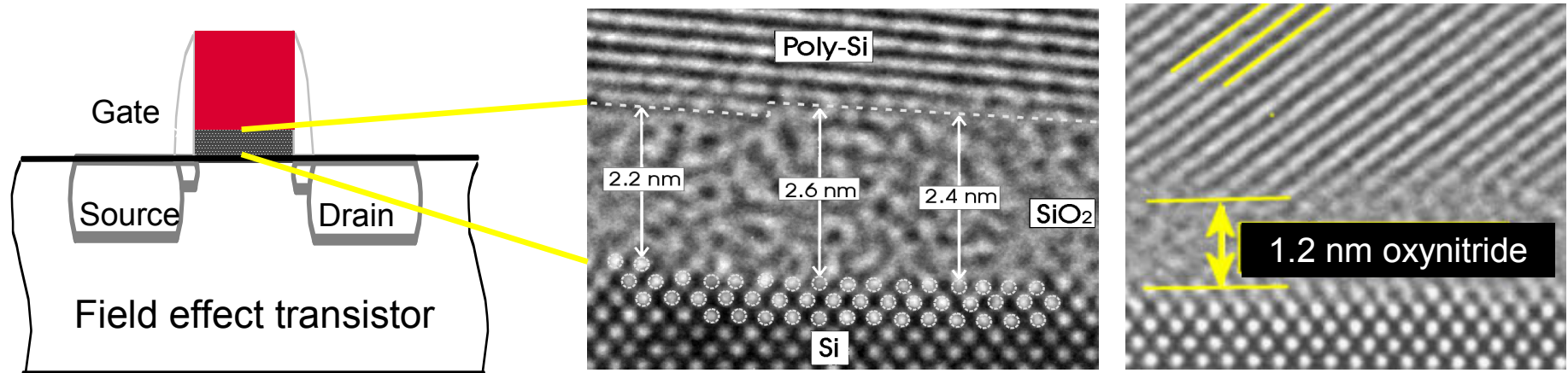


Why Classical Scaling Died: ATOMS DON'T SCALE!



- ❑ **Assume only 1 atom high “defects” on each surrounding silicon layer**
 - For a modern “scaled” oxide, ~5-6 atoms thick, 33% variability is induced
- ❑ **The bad news**
 - Single atom defects can cause local current leakage 10-100x higher than average
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- ❑ **The really bad news**
 - Such “non-statistical behaviors” are appearing elsewhere in technology
 - ❑ **Unless you're a company driving frontier of device & circuit simulation**