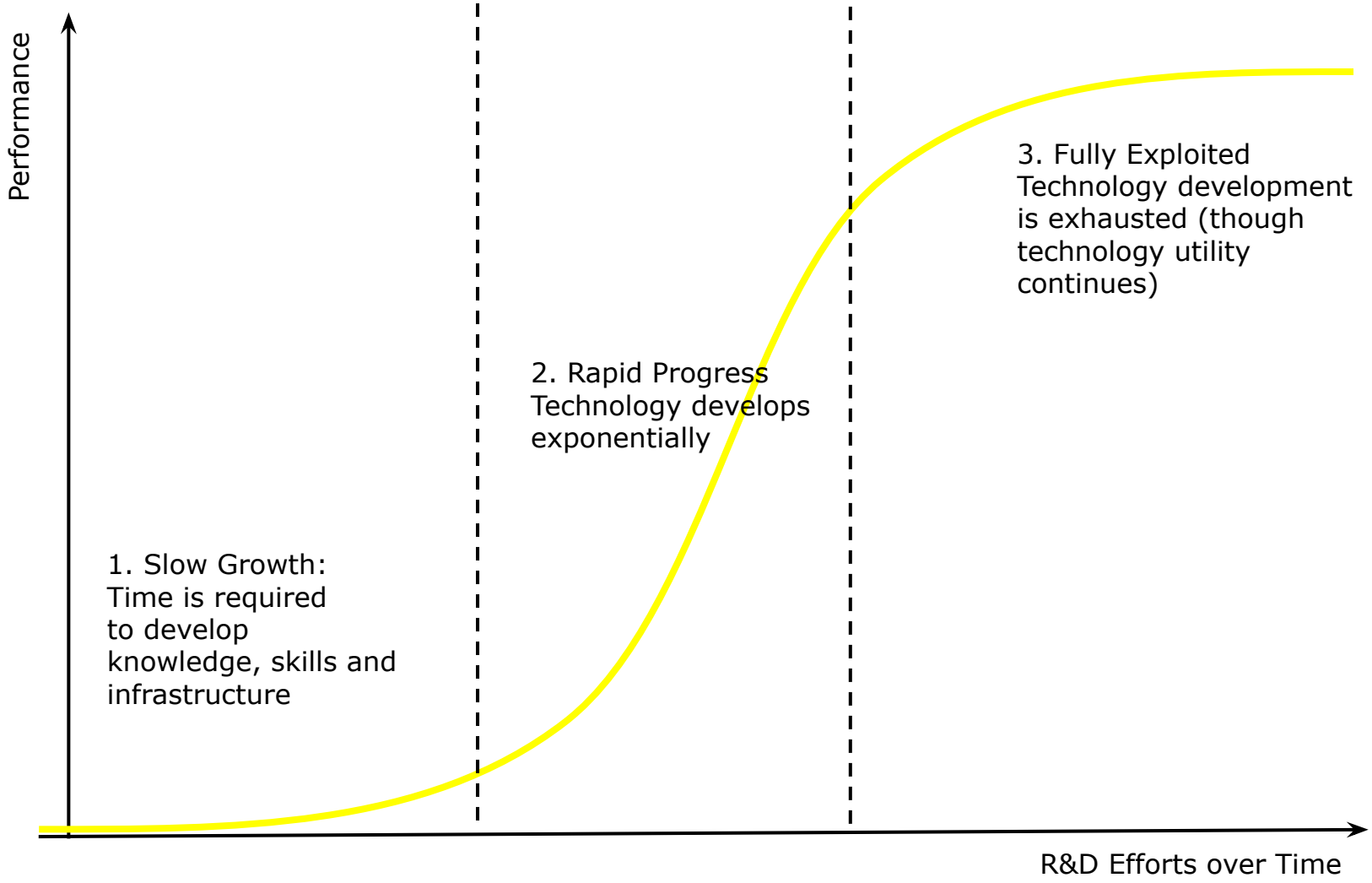
Technology Maturation & Evolution

Theories on the Evolution of Innovation

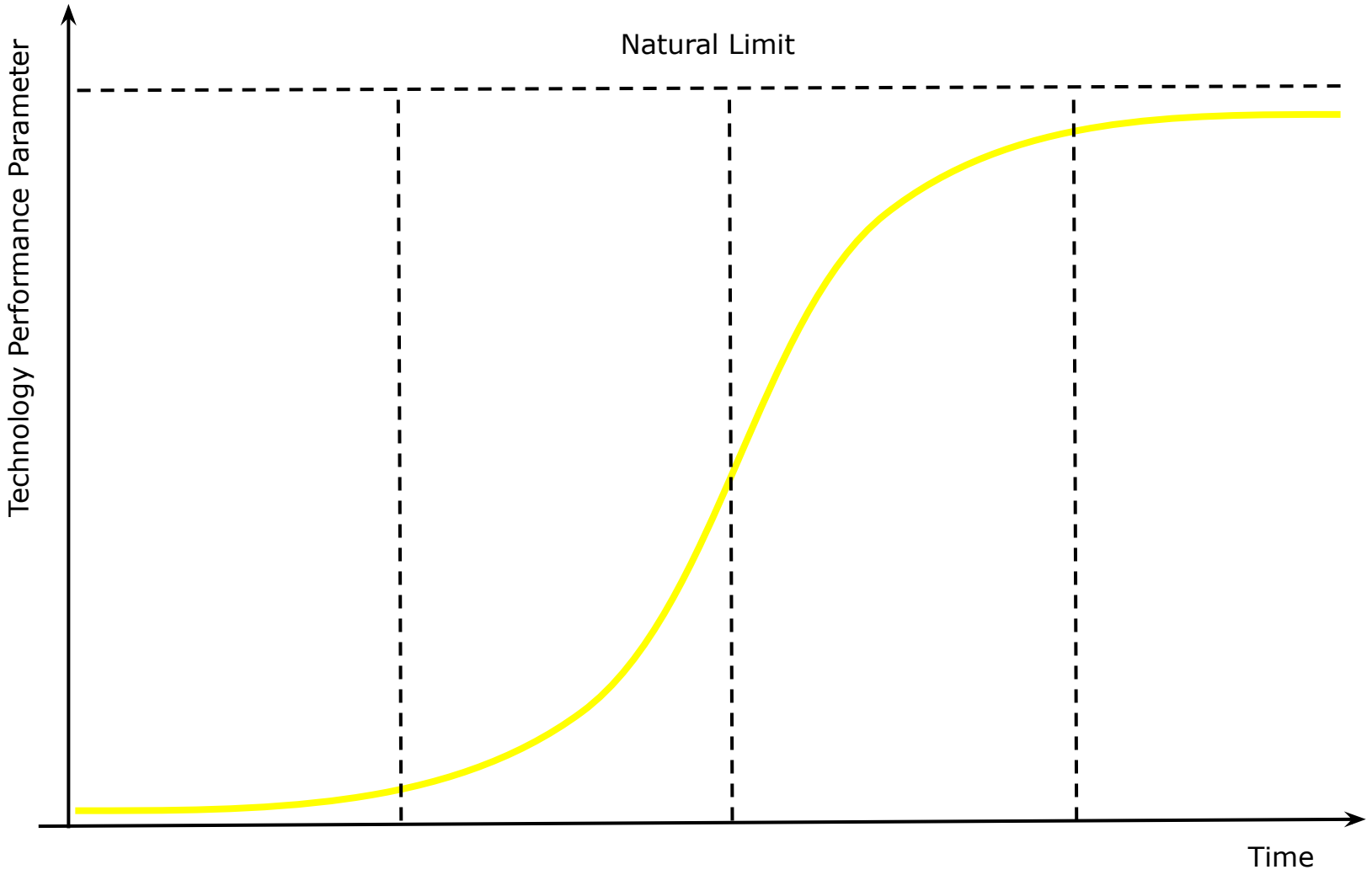
- Dominant Design Theory
- Market and Trajectories Theory
- Modularization Design Theory
- Technology S-Curve Theory

Technology Trajectories & S-curves

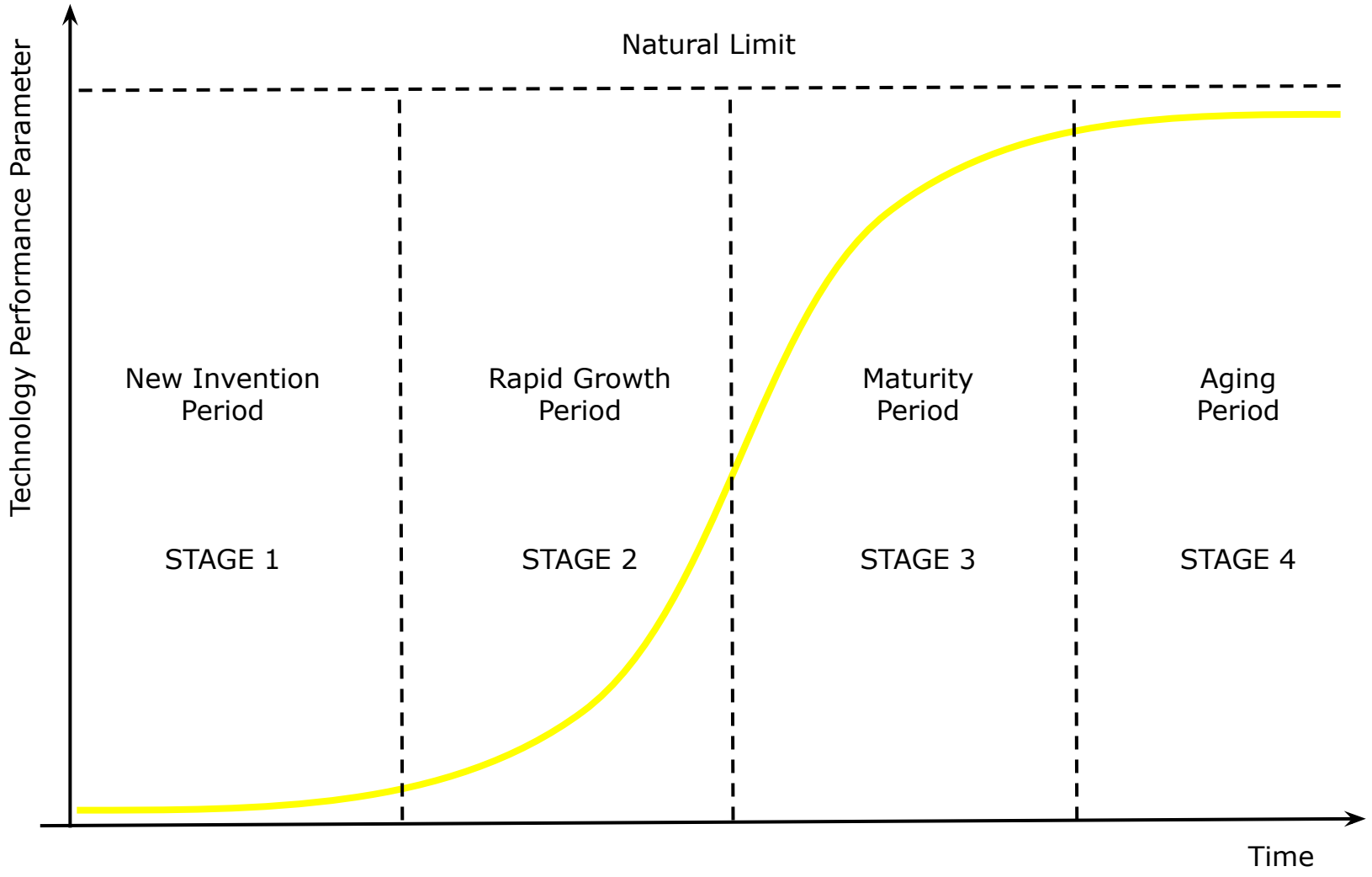
Technology Lifecycle & Foster's S-curve



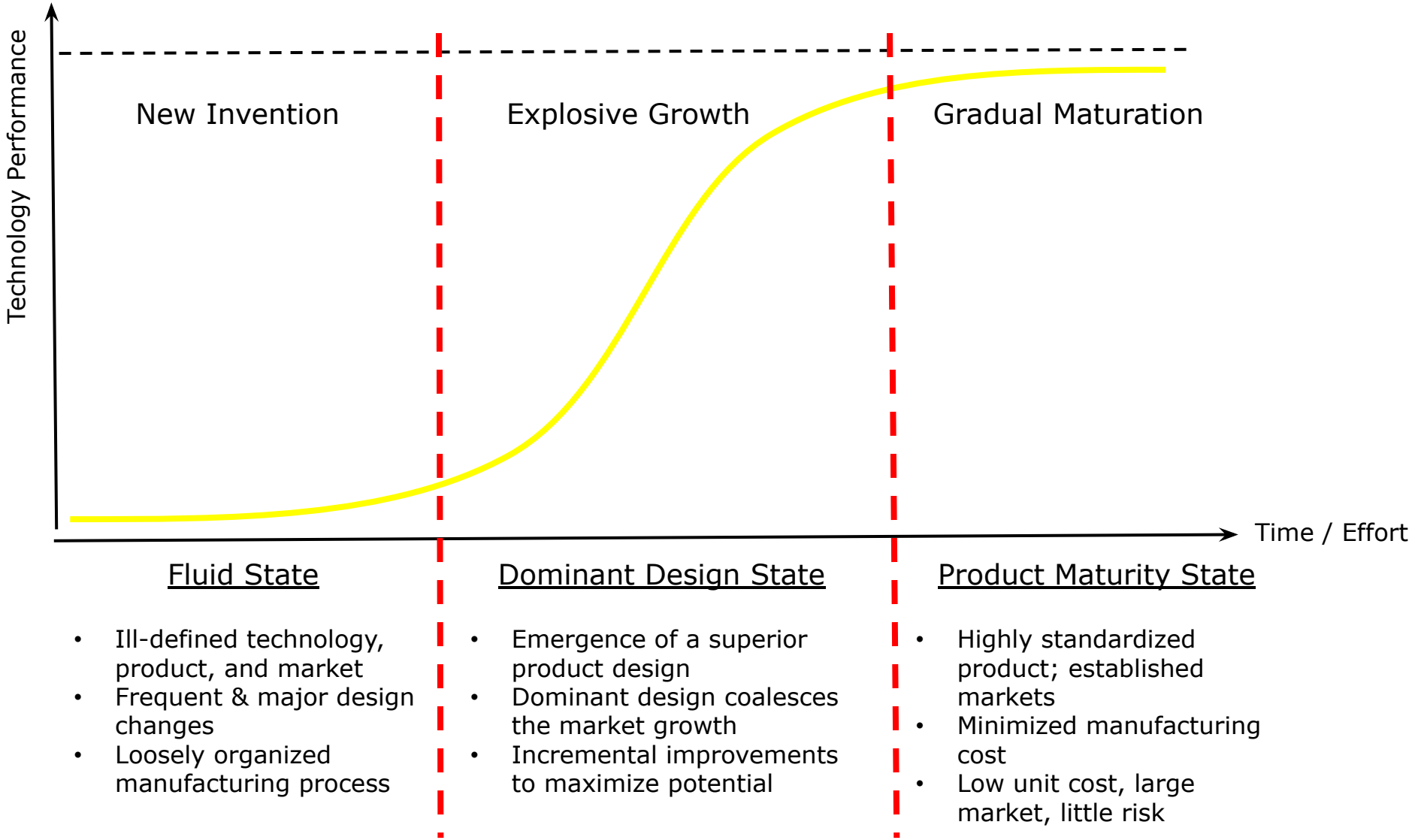
Stages of the S-curve



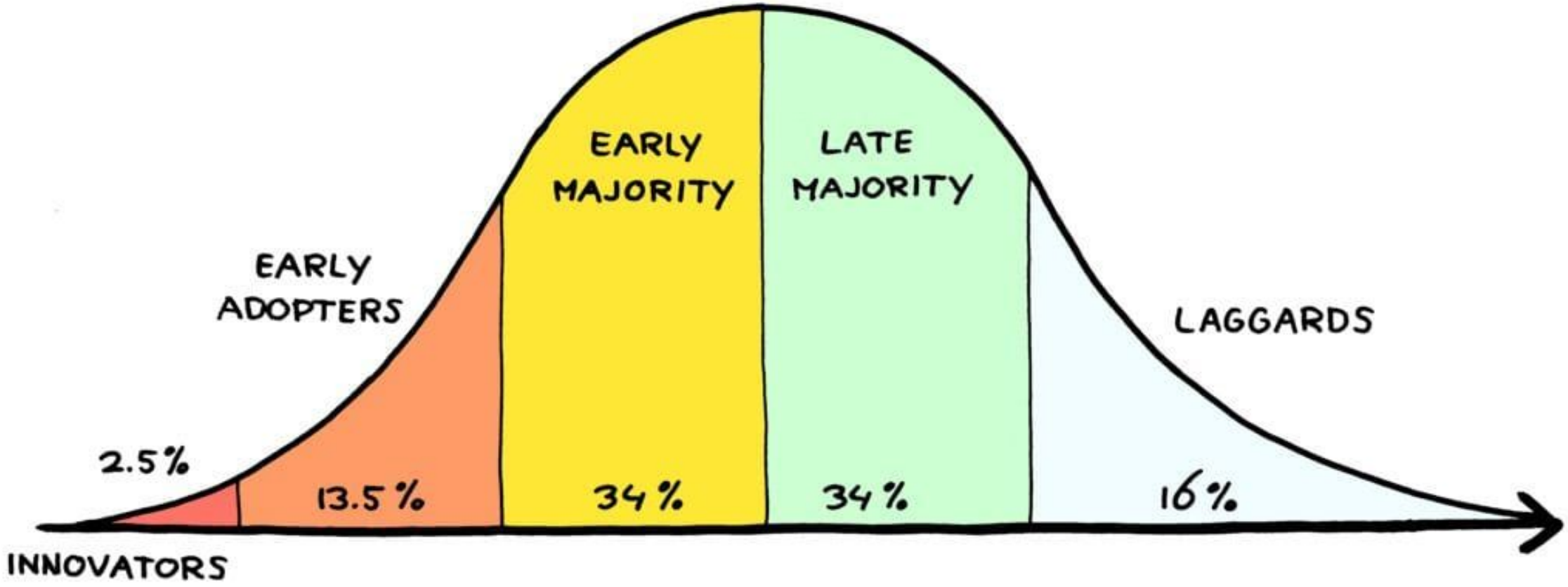
Stages of the S-curve



Typical Technology Growth Pattern

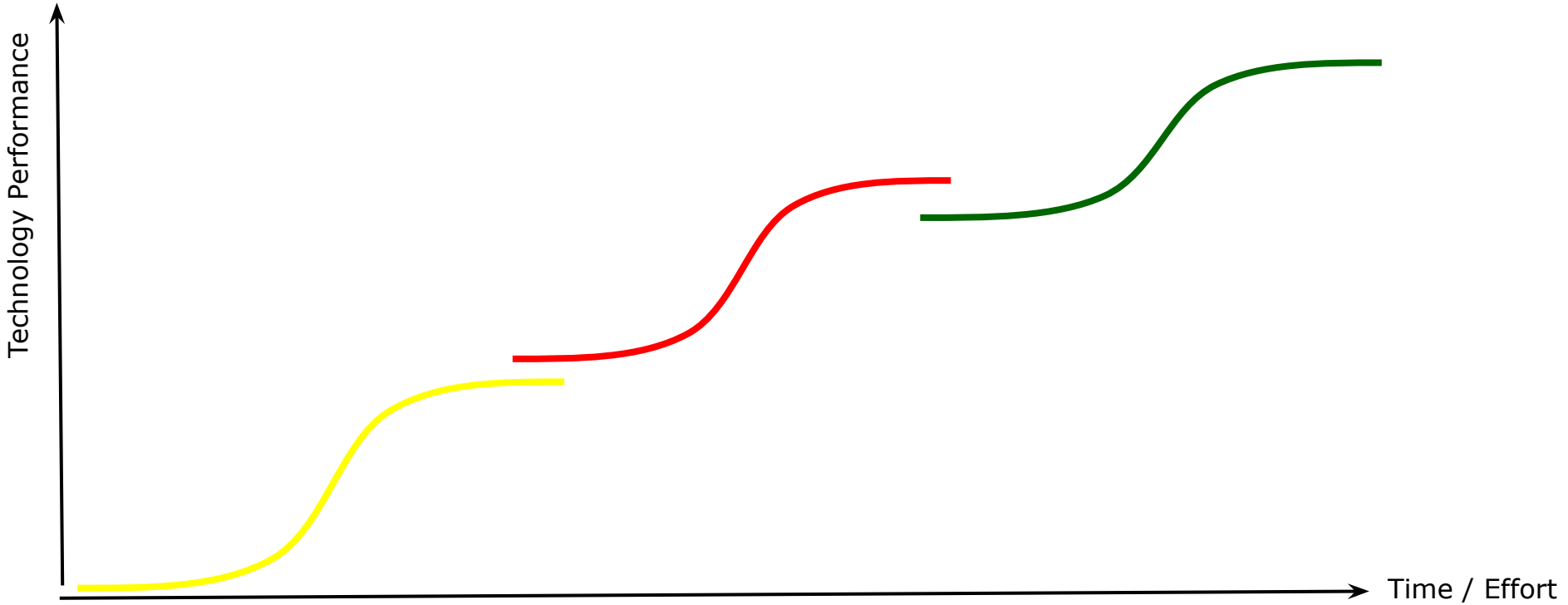


Diffusion of Innovation Theory



E.M. Rogers, 1962

Typical Technology Growth Pattern



Fluid State

- Ill-defined technology, product, and market
- Frequent & major design changes
- Loosely organized manufacturing process

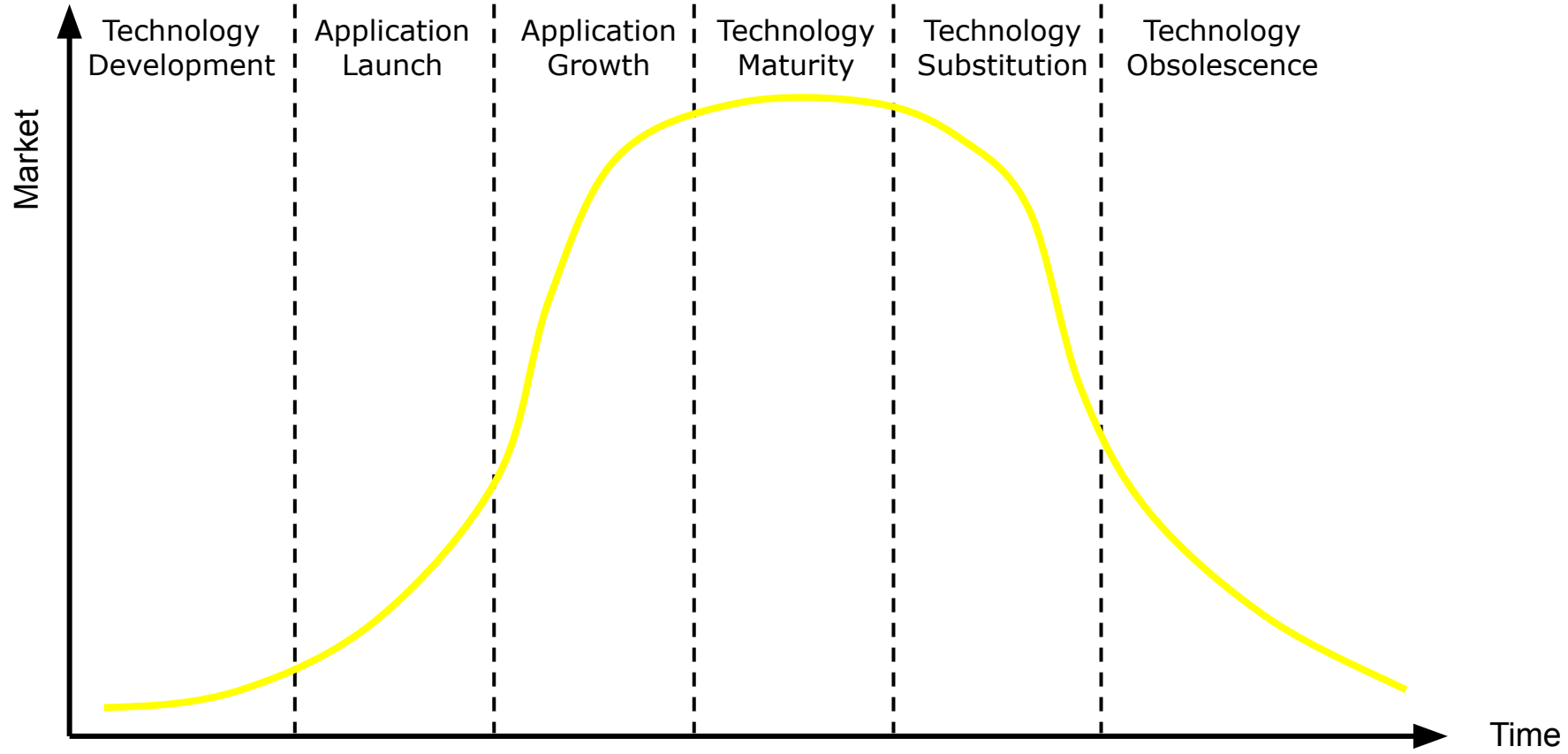
Dominant Design State

- Emergence of a superior product design
- Dominant design coalesces the market growth
- Incremental improvements to maximize potential

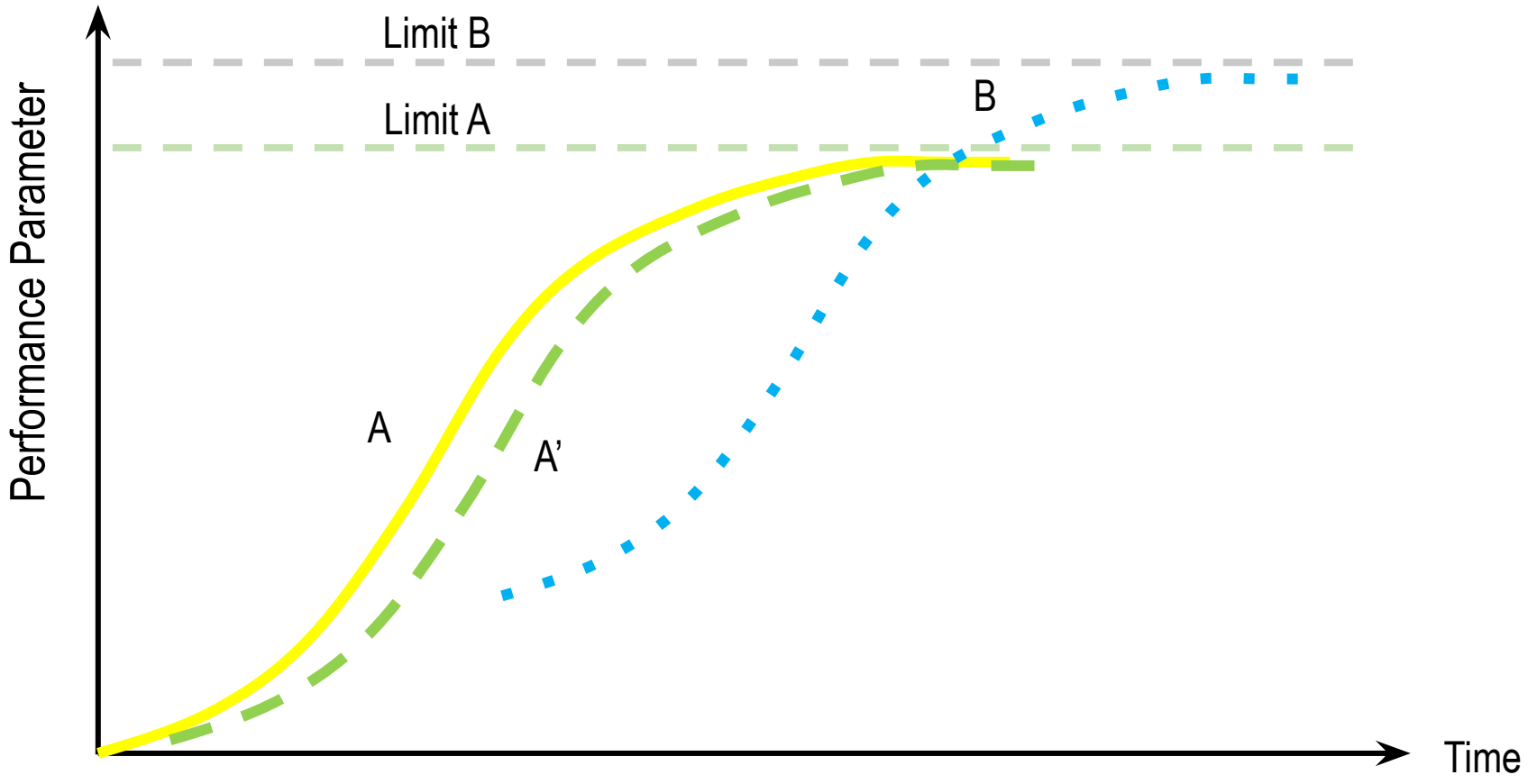
Product Maturity State

- Highly standardized product; established markets
- Minimized manufacturing cost
- Low unit cost, large market, little risk

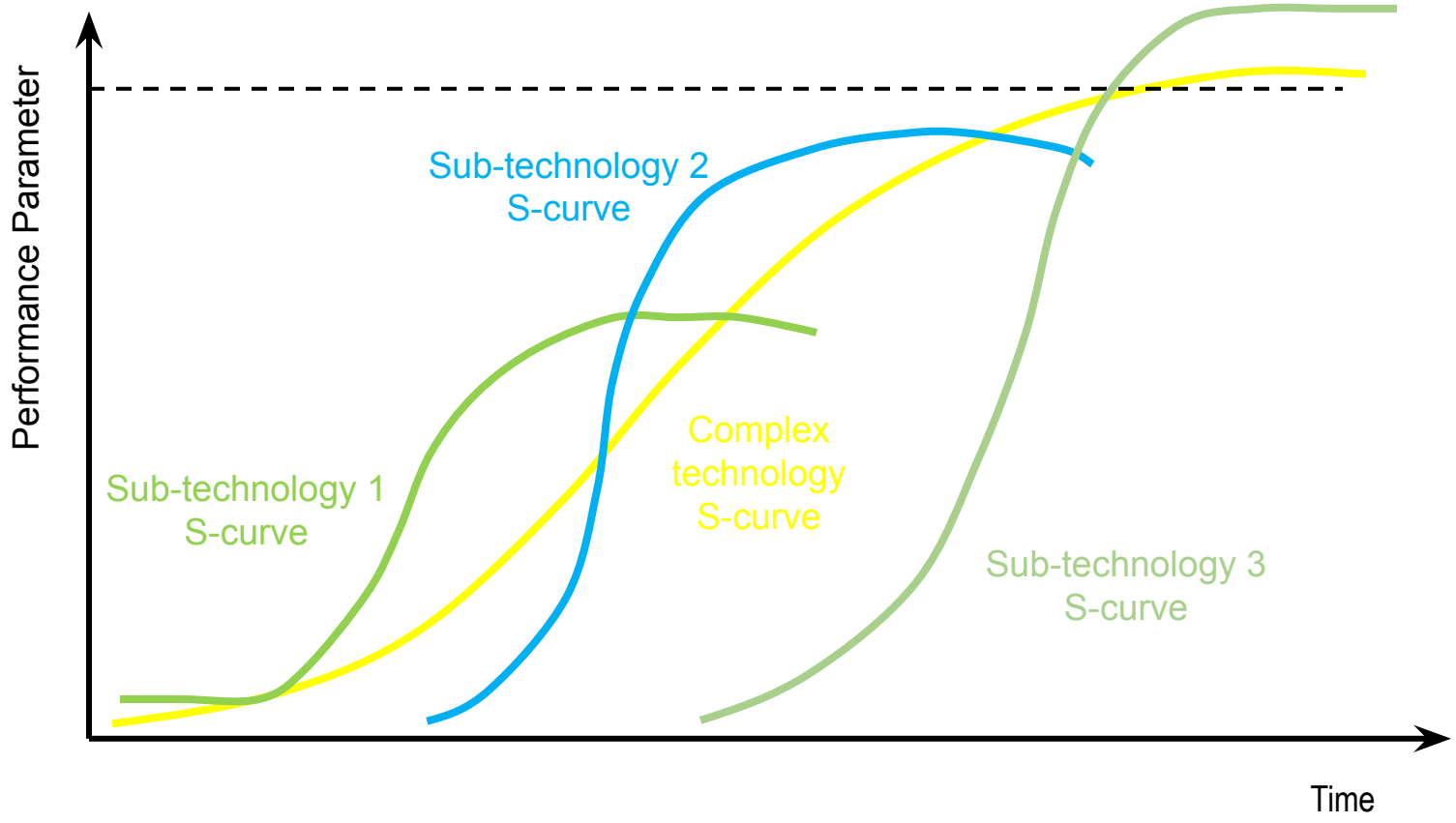
Technology Pattern as dictated by market usage



Characteristics of the S-curve

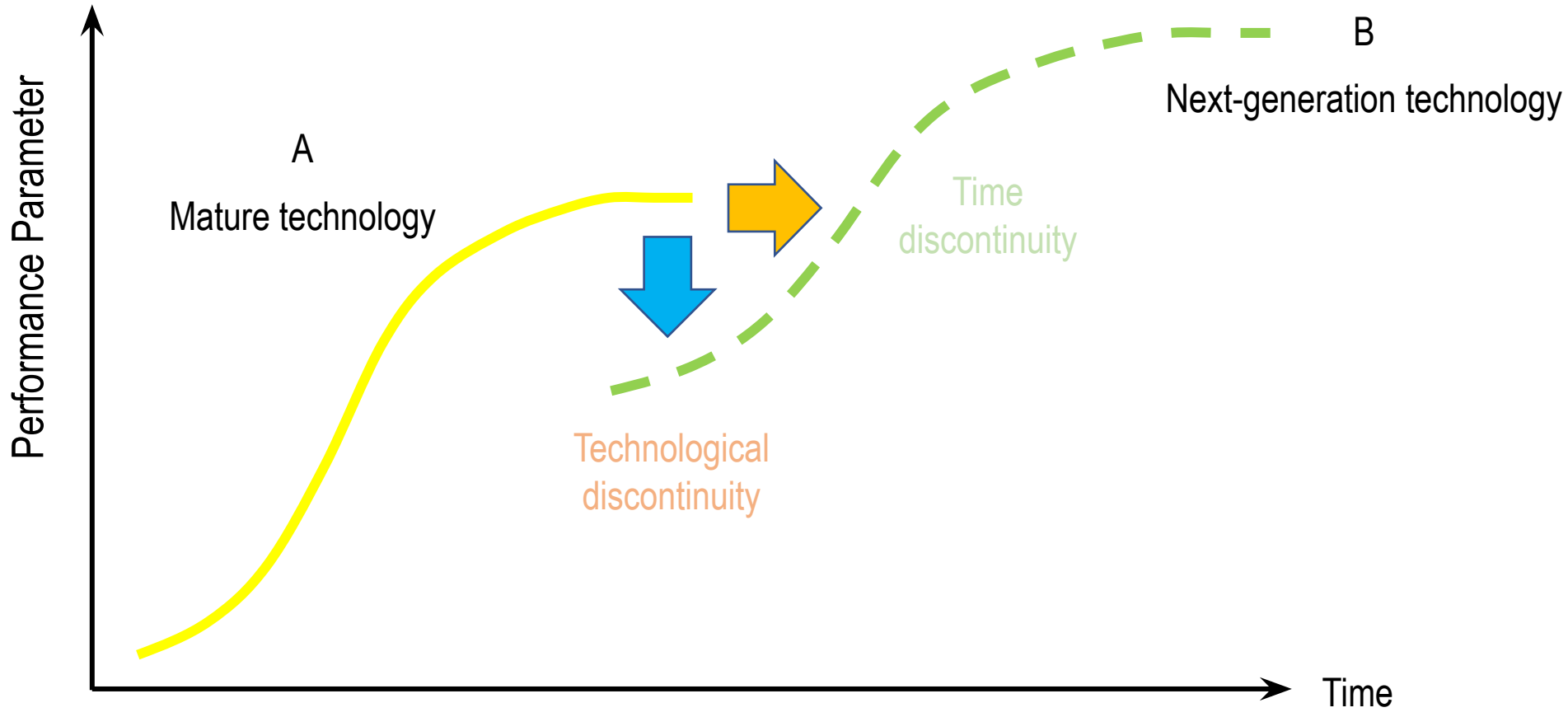


S-curves for complex technologies



Technological Discontinuities & S-curve Jumps

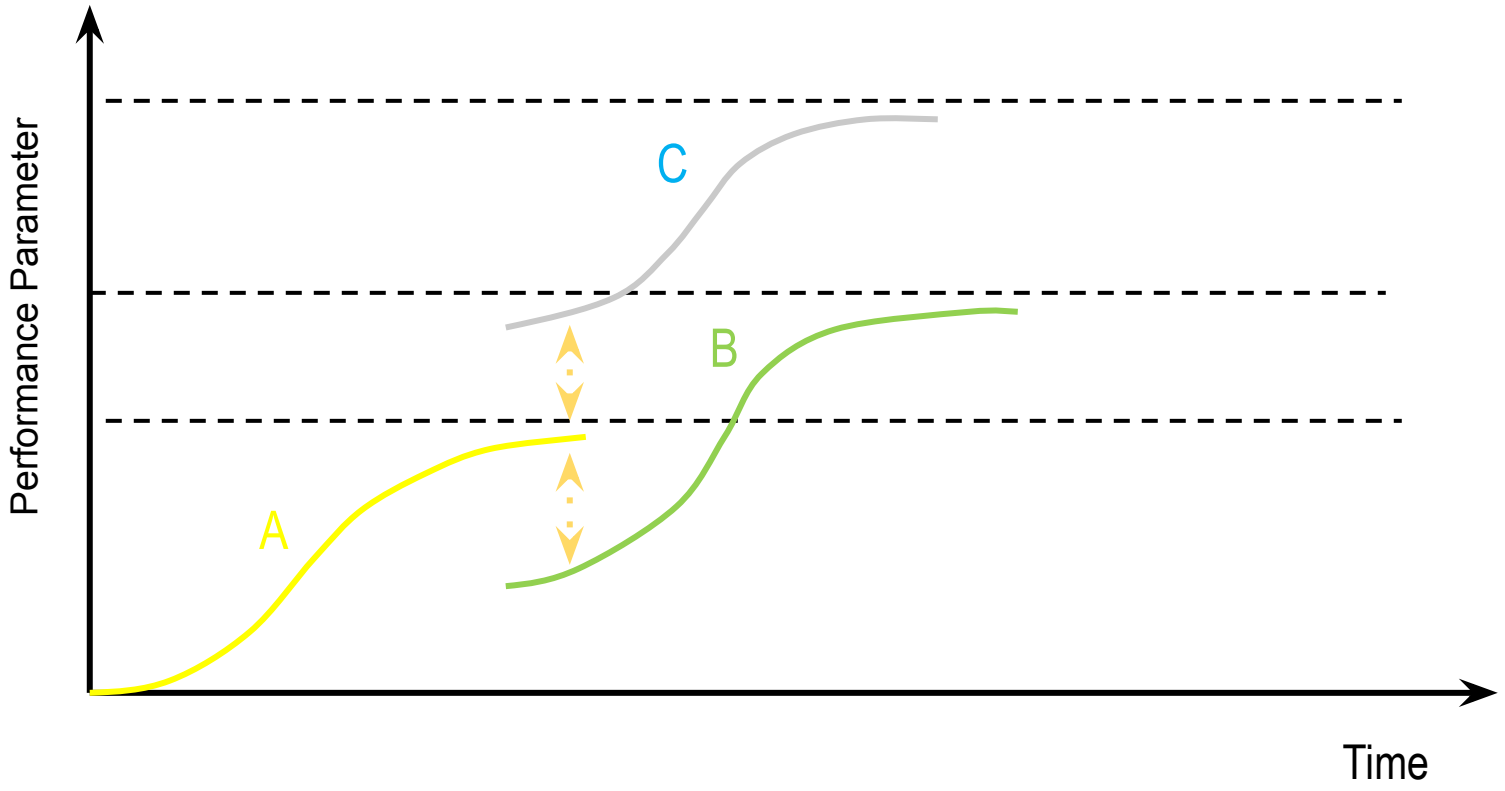
S-curve Jumps: Technological discontinuity



Triggers for discontinuities

- Emergence of new markets
- New technologies
- New political rules or legislation
- Change in market sentiment or behaviour
- Fractures along ’fault lines’
- Unplanned and unthinkable events
- Business model innovation
- Shifts in techno-economic/geo-political paradigms
- Architectural innovation

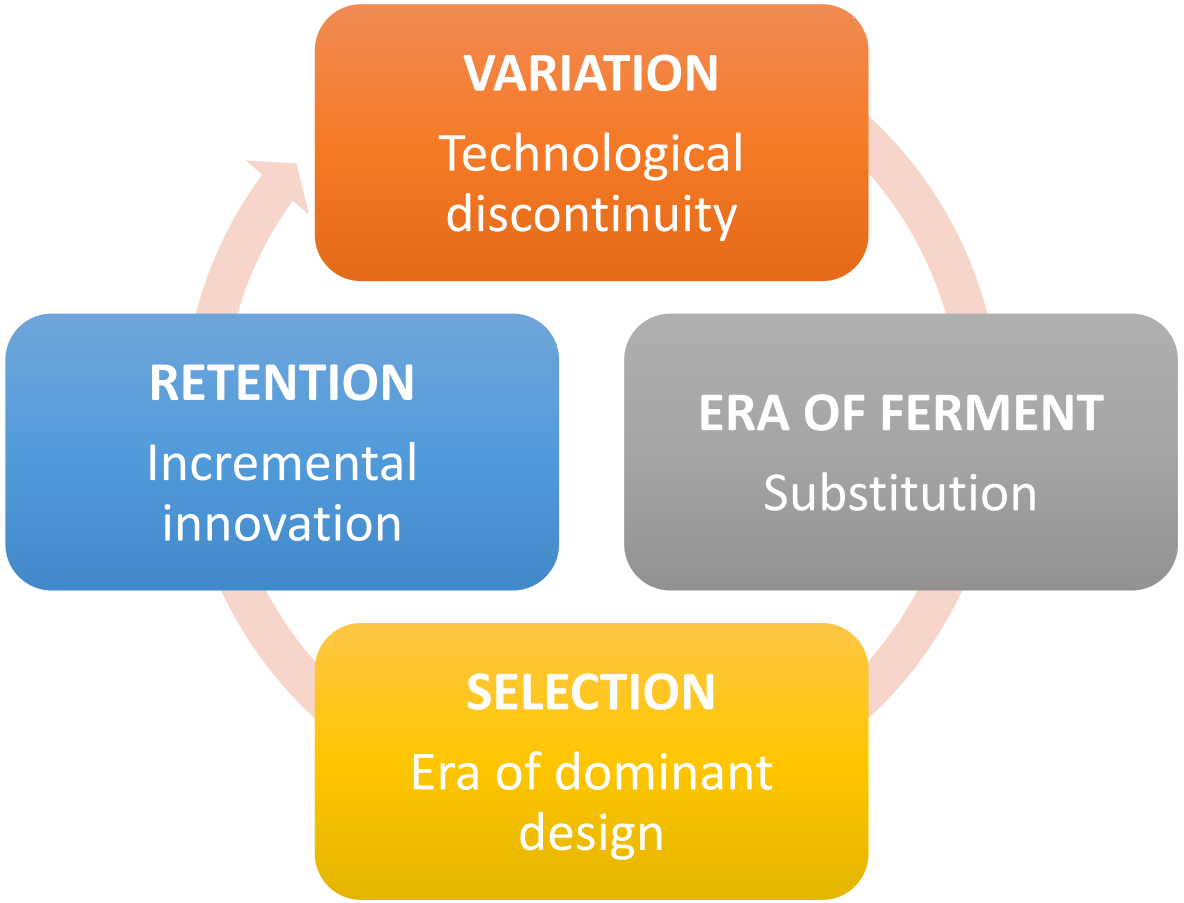
S-curve Jumps: Technological discontinuity



Socio—cultural Model of Technology Evolution

Cycle of Technological Change

Anderson and Tushman argued that technological change can be characterized by socio-cultural cyclical processes



End of lecture